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MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING •

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

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Guaranteed Circulation This Issue
10,471 of Which 9,943 is Paid

There's
money for
you
in this
"furniture"
business

Stromberg-Carlson
No. 120 Switchboard

Are *you* using the modern trend toward high style as a means of increasing your profit? The hardwood bench, bare lights and "information" window of yesterday are giving ground to the modern reception room with its indirect lighting and graciously styled furniture.

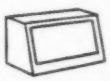
There are probably many businesses in your area who would gladly expand to a PBX, if they knew that you can supply these attractive Stromberg-Carlson switchboards.

Two-tone walnut veneers and harmonizing sun tan panels of these two switchboards blend well in any office setting. *And* you can use these switchboards anywhere. You're free to connect either board with a manual *or* dial central office.

Give your revenue *and* your goodwill a shot in the arm. Offer the handsome styling of these two Stromberg-Carlson switchboards. For more information, ask your Stromberg-Carlson representative.

No. 120 switchboard has lots of operating features, including:

- **TRUNK RECALL.** Even though operator may be slow in pulling down cord after an extension hangs up, the trunk line is immediately freed for another call.
- **EASY TO MAINTAIN.** Flush-mounted rear panel lifts out (no tool needed), and relay gate swings out for easy access.
- **MANY SERVICES.** Each cord circuit has ringing keys, ring-back key, listening and dialing key, through dialing and night connection key.
- **CONFERENCE CALLS** (optional). As many as five lines may join in on one conversation.
- **4 CIRCUIT COMBINATIONS.** Switchboard available with choice of four combinations of Supervision, Battery Source and Trunk Splitting.



No. 121 cordless has these features and many others:

- **TOLL PROTECTION.** "Instantaneous busy" feature warns attendant that trunk is taken by toll operator.
- **COMMON TALKING.** Attendant may continue to answer calls on non-trunk lines, even when all five connecting circuits are in use.
- **NO FALSE ALARMS.** Each line has a line relay, eliminating false alarms caused by line leakage.
- **EASY TO MAINTAIN.** Key panel is hinged. Top, sides and back lift off as a unit for easy maintenance.
- **HOLD LAMPS.** Green lights stay lit until called station answers. Attendant knows when call is completed.

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Stromberg-Carlson No. 121 Cordless Switchboard

Makers of Famous XY® Equipment, Telephones, Switchboards, Sound Equipment and Electronic Carillons; Industrial, Intercommunication Systems; Television, Radios and Radio-Phonographs.

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UNIVERSAL S

D-1000 DIAL DESK MASTERPHO

- EASILY CONVERTED FROM DESK TO WALL SERVICE
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- INTERCHANGEABLE COMPONENTS
- UNIFORMLY PERFECT TRANSMISSION
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- MINIMUM INVENTORY

D-1100 DIAL WALL MASTERPHONE

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Adaptable to All Types of Subscriber Telephone Services!

Kellogg *1000 Series Masterphones* have proved their adaptability . . . have consistently demonstrated superior universal service where it counts most—in every type of common battery or magneto Exchange operation! It's the fundamental Kellogg design that makes expertly-engineered *Masterphones* completely adaptable to any commercial ringing service —including the new Kellogg high impedance biased and harmonic type ringers. Complete versatility in ringing service is one of many advantages Kellogg Masterphones give telephone operating companies. You are invited to write for full details, or ask your Kellogg representative to show you how *Masterphones* make any modernization program modern!

Only MASTERPHONE
Features
The KELLOGG TRIAD CIRCUIT

The outstanding Kellogg Triad-Circuit offers high side tone reduction potentiality, and provides universal circuit applications. The high output transmitter and side-tone control features give the Kellogg *Masterphone* consistently higher effective transmission.

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COMPANY_____

STREET_____

CITY_____ ZONE____ STATE_____

THE LEICH 100 TELEPHONE!

WALL OR DESK MODEL

With the Leich 100 you are never short a wall or desk telephone. For the one instrument serves as either wall or desk model. You don't change, add or buy a thing. Even on dial models, it's necessary only to rotate the dial so the numbers are right side up if the telephone is to be installed as a wall model. This exclusive Leich feature will save you time and trouble.

LEICH

This is more than just another *good* telephone — this is the *finest* telephone instrument you can install.

You won't have to ask your subscribers how they like this new Leich 100. They'll tell you of their own free will — that never before have they heard this well over the telephone.

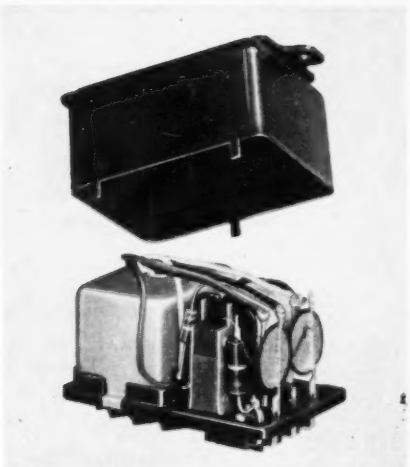
The Leich 100 telephone, equipped with the T1 transmitter, the U1 receiver and the new Leich network brings you the highest degree of transmission efficiency available. The longer your lines, the more readily will you notice the improvement in *both* transmission and reception.

Write today for our bulletin which gives complete information.

new transmitter and receiver units

Leich 100 telephones have the new Western Electric T1 transmitter and the new Western U1 receiver. The T1 transmitter gives you the highest transmission output available and the U1 receiver offers more efficient reception with a wider frequency response. The new handset unit is shorter and considerably lighter.

brand reception are improved so much— u subscribers will hardly believe it!



the new Leich 100 network

This new Leich 100 network gives the increased side-tone control which is so necessary to maintain the gains produced by the new transmitter and receiver. It permits maximum transmission on long loops and reduces it on short ones. The Leich 100 network is made under license from Western Electric and its circuit is identical to that used in the Western type 500 telephone.

CH MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907
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GENERAL SYSTEM

XUM

FLASHES AND PLUGS

MOST TELEPHONED MAN. The little girl who (according to the ancient joke) when queried about her household duties, replied that they consisted partly of "holding the receiver to Mama's ear while she sewed" should have grown up in the White House! Seems Mr. Eisenhower could profitably use her services.

In order to take some of the work load off the Presidential shoulders, White House staff workers intercept at least 300 telephone calls a day. The President's appointment secretary, for instance, gets an average of one telephone call every two minutes. (Mail pours in in similar quantity—it averages between 10,000 and 40,000 pieces each week.)

• • •

STUCK WITH THE BILL. A resident of Rochester, N. Y., paid her telephone bill the hard way.

For nearly 30 minutes, the 70-year-old woman waited while a patrolman and a telephone corporation official worked to free her right hand from a night depository slot in the side of the Rochester Telephone Corporation building.

She told officials her little finger became wedged in an inner slot when she attempted to push the envelope including her payment through the narrow opening. Several years ago, her finger was cramped and permanently twisted as result of a blood condition.

Fortunately, before too long, she was able to hail a passing police car.

• • •

A NEW HAND ON THE PURSE STRINGS. A few weeks before Apr. 24, while some townspeople were vacationing in sunny Florida, the Milwaukee (Wis.) *Journal* reports, the papers down there gave big headlines to Wisconsin's last snow of the winter. It was a feeble snow, to be sure, and melted quickly, but Florida likes to make its vacationers feel exceedingly lucky.

The mother of the family under consideration is of the type who has to know that the children are dressed correctly when they go outside, so she began to worry. That night she telephoned home (Milwaukee) from Florida. Her four-year-old, Mary Lynn, happened to answer the telephone.

"Mary Lynn," she began, "your boots are in the hall closet. . . ."

Mary Lynn is not very old, but this struck her as a rather foolish call.

"Mommy, I know where my boots are," she scolded. "And don't talk any more. It costs money." With that she abruptly broke off the connection.

Her mother thought it over for several minutes, down in Florida, and finally concluded it would be pointless to place another call. Mary Lynn seemed to have the situation at home well in hand.

CIRCULATION

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Hubbard's new Glo-Guard Guy Protector

● reflects brightly in headlight glare ● easily visible on dimly lighted streets or poorly lighted areas ● readily visible to pedestrians at night ● Cor-ten steel construction assures long life, high strength and light weight at a new low cost ● top quality double dip hot galvanizing assures superior resistance to atmospheric conditions

Protect the public from dangerous projections both day and night with Hubbard's new Glo-Guard Guy Protector, with the added feature of luminous areas that glow in the dark for additional visibility.

This new Hubbard guy protector is available in two lengths, 7 feet (Stock No. 718) and 8 feet (Stock No. 818), with attachment holes and clips designed for universal application to guy wires, rods or clamps. The clips and hole spacing allow the protector to be mounted close to the ground or at any height. Heads of attachment bolts are trapped so they will not turn as the nuts are tightened.

Hubbard Glo-Guard Guy Protectors are available for immediate delivery.

Your Hubbard representative will show you a model of this new Glo-Guard Guy Protector on his next call. If you want information immediately, please contact your nearest distributor or Hubbard and Company, 6301 Butler Street, Pittsburgh 1, Pa.

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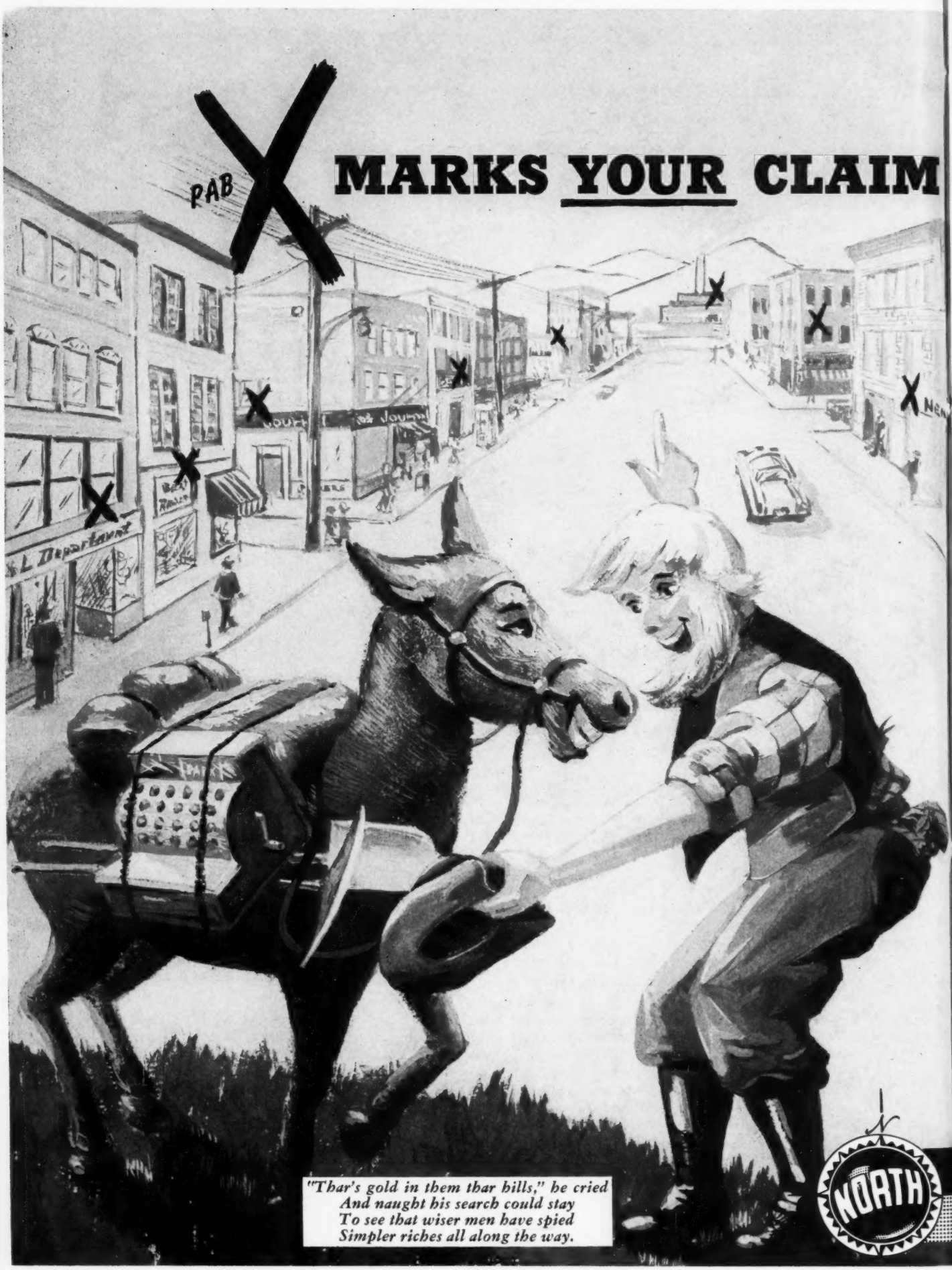
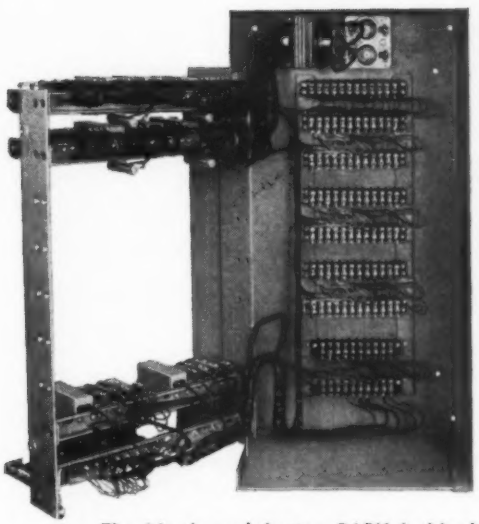

PAB
MARKS YOUR CLAIM
"Thar's gold in them thar hills," he cried
And naught his search could stay
To see that wiser men have spied
Simpler riches all along the way.
NORTH

M IN REAL "PAY DIRT"



The North push-button PABX is ideal wherever requirements will not exceed 6 CO trunks and 20 stations. All stations are equipped to originate, answer, hold and transfer calls.

You need not trek to distant hills in search of good prospecting when you run an on-the-ball telephone system in an up-to-date community. You have a claim already staked out within easy reach of your own office.

Take an analytical trip through your subscriber area. It's a ten-to-one probability that you will find a surprising number of opportunities to increase the "gold-standard" of the plant you now operate, by selling the additional advantages of PABX Service to commercial, industrial, professional and institutional customers.

It will not be difficult for you to see why the most practical equipment with which to prove in this extra business is NORTH PABX. Whether it be a modest push-button installation or hundreds of stations, the use-tested dependability and freedom from service back of North equipment is a matter of record with many successful telephone companies.

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Ups Your Revenue-To-Plant Ratio

THE NORTH ELECTRIC MANUFACTURING COMPANY

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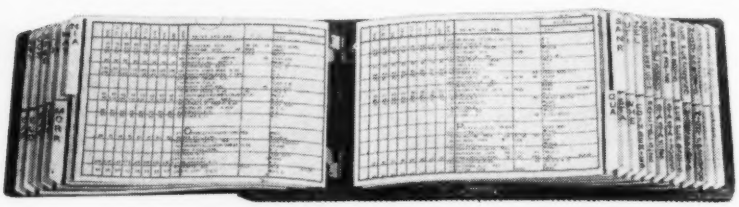
• Multi-Card Bulletin Holders

Developed by Acme engineers working in cooperation with telephone engineers to meet the exacting needs of Bell and Independent telephone companies, to conserve time, reduce cost of operation and improve customer service.

In sizes and capacities to meet individual requirements. They employ the use of clear transparent cellulose acetate pockets which hold card inserts. Suspended on steel hangers with 2, 3 or 4 pockets per hanger, both sides are visible. Made especially for Acme Bulletin Holders, they provide real protection for the printed inserts. They are ready for use with permanently attached hinges and reinforced index tabs. Card inserts do not require any die-cutting or punching and any reproducing process (typing, printing, etc.) may be used.



Vertical units are carried in stock in 3 sizes with 10, 15 or 20 hangers—each available with 2, 3 or 4 pockets per hanger, providing capacities up to 3,840 listings. Made on order to fill any capacity requirements.

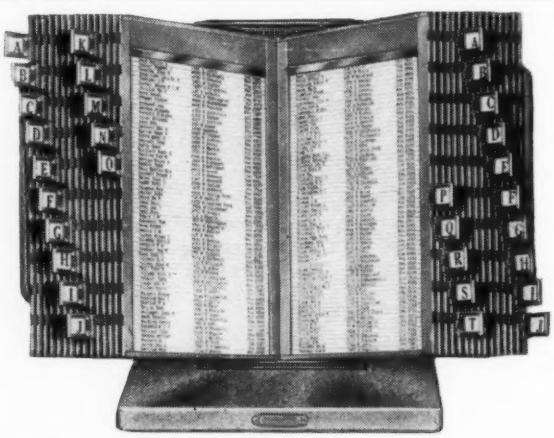
Horizontal units, recommended where space from front to back of key shelf is limited. Made in various sizes, to provide required capacities, utilizing the *width* space.

• FLEXOLINE Equipment

Telephone companies everywhere have been able to render an improved service at lower cost through the use of Acme FLEXOLINE equipment, designed to meet the exacting requirements of the industry.

Names are typewritten on FLEXOLINE Strips, separated and filed in the correct alphabetical or numerical sequence, in FLEXOLINE Frames, always maintaining an up-to-date list. For multiple appearances, FLEXOLINE Strips are indexed with duplicating machines, assuring uniformity and accuracy in all appearances of the records.

Acme FLEXOLINE Desk Stands are ideal for Rate and Route Centers. Any frame is available for instant reference with a single motion. The Desk Stands tilt slightly backward, causing frames to stay open without being held. A few hundred or many thousands of listings are held *visible* for fast and accurate reference.



Acme Visible Equipment has been designed for telephone use by Acme Systems Engineers in close cooperation with practical, experienced telephone experts. For information and suggestions, address Telephone Systems Department.

Here are two informative booklets illustrating and describing various units which have been designed for, and use-tested by, telephone companies throughout the country.

Send for your copies today!

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ACME VISIBLE RECORDS, INC., Telephone System Division, Crozet, Virginia

Please send us illustrated booklet

☐ #994 on Acme Multi-Card Bulletin Holders ☐ #982 on Acme Flexoline for Telephone Companies

☐ Have representative call. Date..... Time.....

☐ We are interested in Acme Visible equipment for ..... records.
KIND OF RECORD

Company..... Attention.....

Address.....

City..... Zone..... State.....

Use REX
Rural Distribution Cable

MAXIMUM EFFICIENCY AT MINIMUM INITIAL COST.

- **AVAILABLE WITH 6 OR 16 PAIRS**
- **COMPLETELY COLOR CODED**
- **SELF SUPPORTING**
- **HIGHEST POSSIBLE QUALITY**

Rex Rural Distribution Cable is unequalled for quality, performance, transmission and strength. The conductors are #19 solid, bare, soft drawn copper — polyethylene insulated and individually vinyl jacketed. They are completely color coded. Conductors are cabled around an insulated, galvanized steel messenger cable which has tremendously high strength to withstand severest weather conditions and permit longer than usual runs.

Available with 6 pairs — No. RDC-0619-U, or, 16 pairs — No. RDC-1619-U.

Before you invest in Rural Distribution Cable get the complete story about Rex RD cable — it is unquestionably your very best buy.

Write for complete technical data and samples.

MANUFACTURERS OF PLASTIC INSULATED TELEPHONE, COMMERCIAL AND MILITARY WIRES AND CABLES

The REX CORPORATION

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Telephone: Colonial 3-7721

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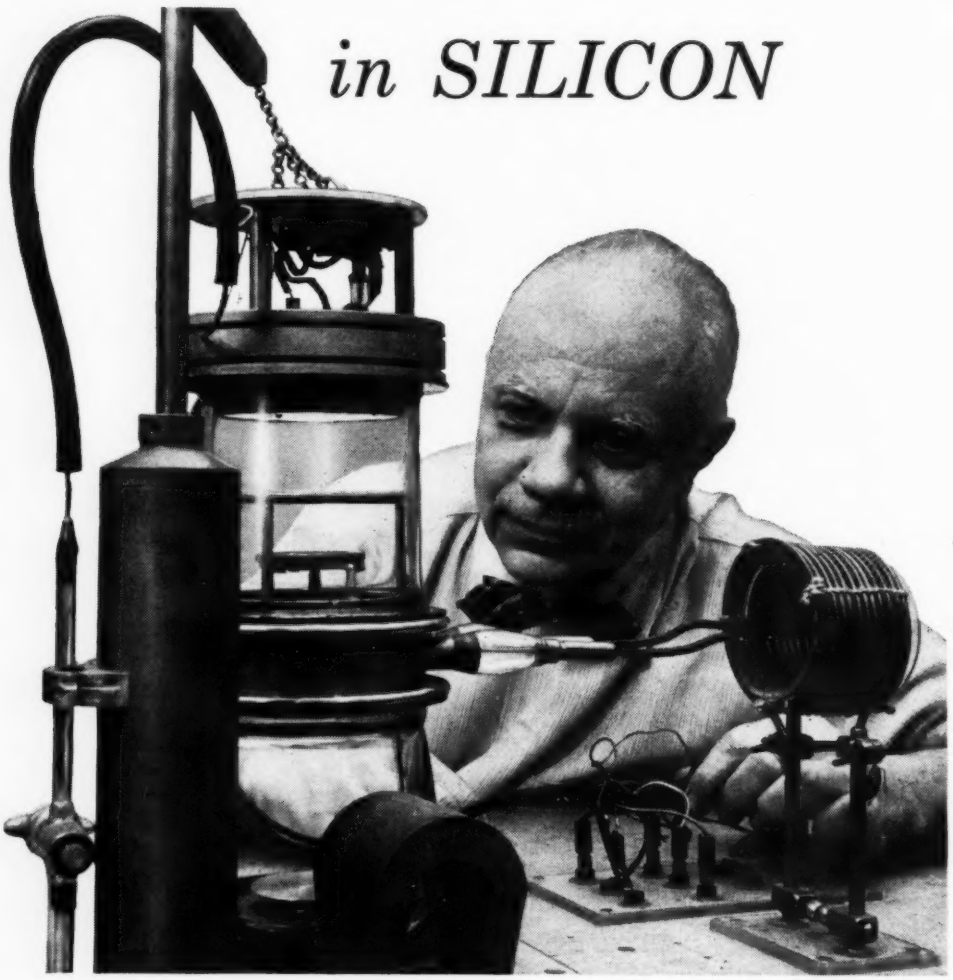
AN ADVENTURE *in SILICON*



One example of junction technology at Bell Laboratories. Here a junction is produced on the surface of silicon by bombardment with alpha particles. Bombardment enhances silicon's performance at very high frequencies.

One day in the 'thirties a revolutionary adventure began for Bell scientists. They were testing an experimental silicon crystal they had grown to make microwave detectors.

Intriguingly, they found that one end of the crystal conducted by means of positive charges, the other end with negative. Positive and negative regions met in a mysterious barrier, or junction, that rectified, and was sensitive to light. It was something entirely new . . . with challenging possibilities.

The scientists went on to develop a theory of junction phenomena. They showed that two junctions placed back-to-back make an amplifier. They devised ways to make reproducible junctions. Thus, junction technology came into being, and the 20th Century had a new horizon in electronics.

This technology has already produced at Bell Telephone Laboratories the versatile junction transistor (useful in amplifiers and switches); the silicon alloy diode (surpassingly efficient in electronic switching for computers); and the Bell Solar Battery which turns sunshine directly into useful amounts of electric current.

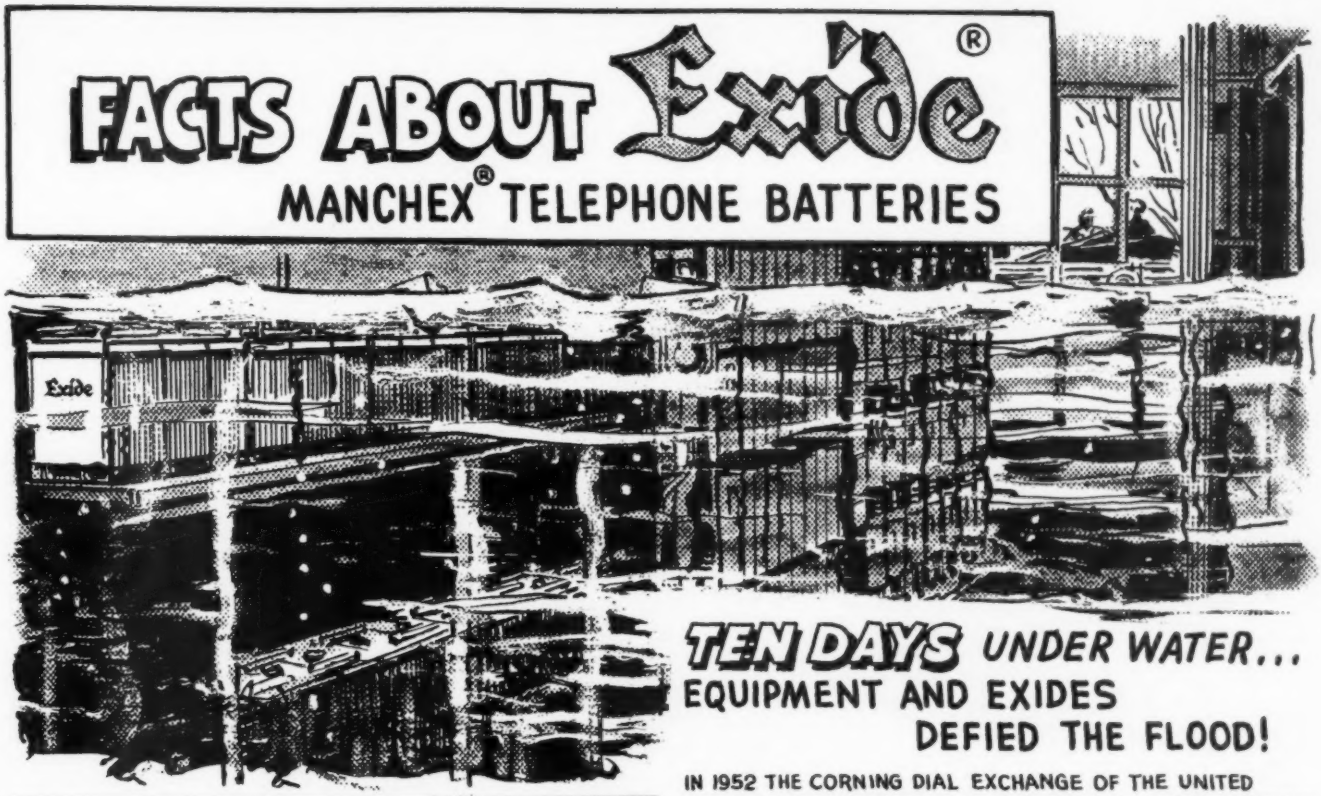
This is one of many adventures in science which make up the day-to-day work at Bell Laboratories... aimed at keeping America's telephone service the world's best.

Bell Telephone Laboratories

Improving telephone service for America provides careers for creative men in scientific and technical fields

FACTS ABOUT Exide®

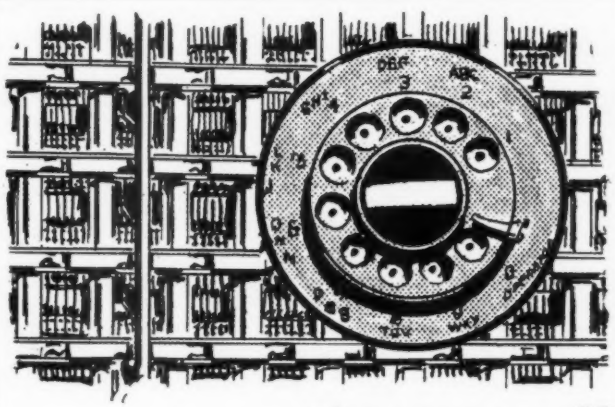
MANCHEX® TELEPHONE BATTERIES



TEN DAYS UNDER WATER... EQUIPMENT AND EXIDES DEFIED THE FLOOD!

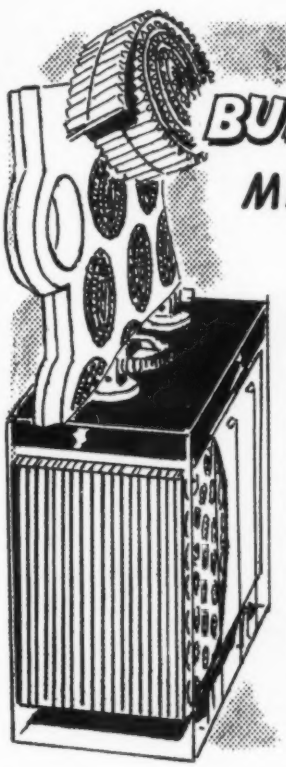
IN 1952 THE CORNING DIAL EXCHANGE OF THE UNITED TELEPHONE COMPANY GOT IN THE PATH OF THE RAMPAGING MISSOURI. PUMPS FAILED—ALL EQUIPMENT WAS FLOODED FOR TEN DAYS! WHEN THE WATER RECEDED, THE 48-CELL EXIDE WAS CLEANED, CHARGED AND PUT BACK IN SERVICE—TO GUARANTEE POSITIVE OPERATION OF VITAL EQUIPMENT—TO FURNISH ADEQUATE RESERVE POWER! DURING AND AFTER EMERGENCIES, RUGGED DEPENDABLE EXIDES PROVE THAT THEY ARE ALWAYS YOUR BEST BATTERY BUY—

FOR ALL TELEPHONE SERVICES!



DIAL SYSTEMS "THINK" AND EXIDES HELP THEM DO IT!

AUTOMATIC SWITCHING DEMANDS A STANDBY SOURCE OF POWER TO INSURE SERVICE CONTINUITY. TO SUPPLY INSTANT, AMPLE POWER, EXIDE MAKES A COMPLETE LINE OF TELEPHONE BATTERIES—IN BOTH GLASS AND PLASTIC. BACK OF EACH EXIDE STANDS YEARS OF CONSTRUCTION SKILL AND ENGINEERING RESEARCH!



BUTTONS OF LEAD MEAN LESS COST FOR YOU

THE IMPROVED PLANTÉ TYPE POSITIVE PLATES OF THE EXIDE-MANCHEX BATTERY ARE OF THE MANCHESTER DESIGN—AN EXCLUSIVE EXIDE FEATURE. BUTTONS OF LEAD DELIVER THE POWER YOU NEED, WHEN YOU NEED IT. OVER A HALF CENTURY OF DEPENDABLE PERFORMANCE IN TELEPHONE BATTERY SERVICE HAS DEMONSTRATED THAT EXIDE BATTERIES WITH THEIR BUTTONS OF POWER ARE YOUR BEST POWER BUY—

AT ANY PRICE!

LET EXIDE HELP SOLVE YOUR TELEPHONE BATTERY PROBLEMS. ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ❷ WRITE FOR FORM 4993, A TELEPHONE BATTERY ENGINEERING AND MAINTENANCE MANUAL.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

XUM

"it says here we could produce MORE!"

We can't speak for Brer Rabbit . . . his production problem is a little out of our line.

But if you're not entirely satisfied with the revenue your present directory is producing, that *is* our business.

Independent telephone companies operating in over 4400 communities are now using our Complete Directory Service Plan It has resulted in substantial increases in net revenue, modern directories and improved public relations.

We're almost certain we can improve the appearance, accuracy and return of *your* directory. Like to talk it over? Just write or call our nearest office.

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by FRANCIS X. WELCH WASHINGTON EDITOR

Payment of REA loans by electric co-ops reviewed. Passing of gross receipts tax on to public issue in Virginia. Three recent important rate cases discussed. Utilities competition suit against REA super-co-op thrown out.

NOW AND THEN, this writer gets inquiries from readers in both the telephone and electric utility field, about whether REA loans are ever entirely paid up. In other words, has it been proven feasible for either a cooperative or a privately-owned company to get *out* of debt to REA, once it gets *into* debt, via a REA loan?

The plain answer is—it isn't easy, or at least it hasn't been easy up to now. Under previous administrations, REA seemed at times to have almost a deliberate policy of encouraging more and more debt obligation, once an original loan was made—either for expansion of original plant facilities or for bringing them up-to-date to meet new service demands. In other words, earlier electric plant facilities contracted with REA loans had a tendency to get out-of-date—with regard to subsequent load and capacity requirements—more rapidly than the loans were being paid off. So new loans, increasing the original obligation (and extending the term of repayment) kept piling up.

But it *is* possible to retire REA loans and it has been done. Not often, only three times, apparently. But it must be kept in mind that these loans run to long terms. The earlier electric loans were made for 20 years. Later on, the term was extended to 35 years. When we stop to think that REA celebrates its 20th birthday this month, it is understandable why so few of the loans (all in the electrification field, of course—telephone loans did not start until 1950) have been paid off, on completion of their full term.

The third and largest of these was paid up, with appropriate breakfast ceremonies at a Washington, D. C., hotel on Apr. 26. Officers of the Boone County Rural Electric Membership Corp. of Lebanon, Ind., presented a check for $18,543 to REA Administrator Nelsen. It was one of the first loans made by REA. It goes back to the period when federal REA was not even a statutory agency, but operating under Executive Order—almost 20 years ago. The original loan of $567,926 was in the first group of three approved by REA.

Two other REA co-ops have paid off their obligations in full, ahead of time—Henry County Rural Electric Membership Corp. of New Castle, Ind. (paid off Apr. 29, 1943), and Gowrie (Iowa) Rural Electric Cooperative Association (which made its final payment Dec. 30, 1954). Observers will keep an eye on the direction of management of these "independent" cooperatives, now that they are entirely free of any restrictions or controls by reason of federal debt obligations.

Virginia Telephone Tax Argued

The important question of passing on special local taxes to local utility customers has been taken under advisement by the Virginia Corporation Commission. This issue, which is generally without precedent, was argued by counsel for the Chesapeake & Potomac Telephone Co. and attorneys for several Virginia municipalities, which are now assessing local gross receipts taxes against public utility companies serving in those communities. The gross receipts taxes vary from one-half of 1 per cent to 3 per cent. The telephone company takes the position that unless the taxes can be passed on to local subscribers, it will be necessary to request a general rate increase.

The opposition, headed by the Virginia League of Municipalities, contend that the company has no right to make adjustments in rates to take care of varying amounts of gross receipts taxes, where it has made no attempt to adjust local rates to compensate for differences in local property taxes. The company's witness stressed the fact that while the amount of money at issue is small at present, there would be a growing tendency for cities to resort to local gross receipts taxes, if the commission should rule that the utility must absorb the difference as a general statewide operating expense.

Allied with the telephone company was a witness for the Virginia Farm Bureau, which called the local tax an "ill-concealed attempt to pass a share (of the cost of government) on to those who received no benefits." If the commission fails to halt this effort of some local communities to collect taxes from the telephone company at the expense of the rest of the telephone subscribers in the state, there is a good chance that such local taxation will snowball into a real threat to the industry's revenue in some areas.

Recent Rate Cases

Along the rate case front there have been three recent decisions, by three high state courts, of interest to telephone companies and worthy of special notice. Two of these were Bell System telephone rate cases from Idaho and Delaware, respectively. One—perhaps the most important one from the standpoint of precedent—was an electric rate case from Virginia.

The Idaho Supreme Court case, in addition to being bad news for the Mountain States Telephone & Telegraph Co., was also a little hard for this reporter to understand. In a nutshell, the court unanimously set aside its own unanimous decision of last December when it rebuked the Idaho commission for denying the company any rate relief.

In its decision of last December, the Idaho court found that the commission had improperly substituted its own "separation formula" (for allocating plant, expenses, and revenues between interstate and intrastate commissions), based on peak toll traffic. It had been

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expected that the commission would get back in line and follow the NARUC-FCC formula (popularly known as the "Charleston Formula"), which is being followed in nearly all of the other states. The court, in its earlier decision, had also disagreed with the commission's assumption of a hypothetical debt ratio (in relation to equity) of 45 per cent, in order to justify holding the telephone company to a lower rate of return.

In its most recent decision—which came about as a result of the state attorney general making a motion for rehearing—the Idaho Supreme Court has turned its back completely on its earlier opinion. It now upholds the commission's decision, not on its merits, but mainly on the technical basis of a presumption in favor of the commission's findings as proper and accurate. In essence, it is a so-called "Pontius Pilate decision," in which the court washes its hands of the merits of the case and passes the buck to the commission. The company management understandably characterized the latest opinion of the court as "wholly unexpected" and "an amazing reversal."

Declaring that rate making is a legislative function delegated to the commission, and not a judicial function, the Idaho court's latest opinion said: "So long as it regularly pursues its authority and remains within constitutional limitations, the courts have no jurisdiction to interfere with its determinations." The opinion concluded in this case that the commission did not exceed its authority or violate the company's constitutional rights. The company asked for the increase in May, 1952, to raise Idaho revenue $1,097,000 a year. The commission rejected it in May, 1953, and the company immediately obtained an injunction on grounds that the existing rates were confiscatory. It started collecting the higher rates, with the difference between the two tariff schedules impounded by court pending final settlement. The fund now totals $2,212,130.

And, so, unless the company's attorney can persuade the Idaho court to grant another rehearing, and perform another complete flip flop, it looks as if the commission's decision denying the company a rate increase will result in an actual *reduction* of telephone rates in Idaho, because the proposed higher rates were being collected under bond. In addition, the company may well have to return over 2 million dollars to subscribers. Regarding the separations formula, the Idaho court now takes the position that the commission has the right to write its own formula. It also concurred in the commission's hypothetical assumption of a higher debt structure for the company, and refused to say that an alleged return of 5.71 per cent on investment (found by the commission to result from the original rate structure) was confiscatory.

The Delaware commission is somewhat more encouraging. It is another example, however, of a rate case being bounced back and forth between the commission and the courts without final result even now. It is the Diamond State Telephone Co. which appealed a commission decision granting only about one-third of a rate increase requested. A lower court found that the commission had failed to give sufficient weight to "reproduction cost" in determining the rate base. On this—the most important question decided on appeal—the majority of the Delaware Supreme Court held:

"For the reasons given herein, we must reverse the finding of the commission as not giving sufficient weight and consideration to reproduction cost depreciated in the light of the evidence and of present inflationary conditions. . . . We have said that sufficient consideration was not given to reproduction costs depreciated, in the light of the evidence and general inflationary conditions.

"That does not mean, necessarily, that the commission shall disregard every other consideration and give weight only to reproduction costs; it means, merely, that sufficient weight was not given formerly to reproduction costs depreciated and that the commission must reconsider its findings in this respect, giving due consideration to the evidence submitted, general inflationary conditions, and in the light of this opinion—in order to fix a valuation which will be 'just and right'."

The Virginia Electric Case

The decision of the Virginia Supreme Court of Appeals is noteworthy for telephone people, although it has to do with confirming a commission allowance of a $4,800,000 electric rate increase for the Virginia Electric & Power Co.—which is a state-wide company serving in that area. What telephone people will find of special interest in this case was the way the court disposed of an argument by the company's rate case opposition—Arlington County—this to the effect that rates should be lower in the heavily populated Alexandria-Arlington area (which is right across the Potomac bridges from the city of Washington). The county thought that because it cost the electric utilities more to serve power customers in the outlying rural or sparsely settled sections, the rate structure ought to be pitched higher for such outlying customers. In other words, the county was contending that rates should be fixed on a community unit basis, following a "cost study" reflecting the actual expense of serving a given community.

This unsound contention is an old story to telephone rate people. But it is noteworthy that the Virginia high court's opinion (by Justice Spratley), disposed of it by comparing the electric rate structure with telephone rate structures. Justice Sprately said that both the power companies and the Virginia commission were quite right in approving the simplification and reduction of state-wide rate schedules to a minimum number of classifications—so that customers in the same business, at different locations, could be served under the same rate schedule. The court's opinion stated:

"The state-wide rule adopted for telephone rate-making may be more logically applied to an electric utility. A telephone utility at least has a unit for division, an exchange. No such unit exists for the electric business. There are many gradations of telephone service conditions; but the service of electricity is the same at all places and its value cannot be distinguished. Of course, the cost of rendering service in one area differs from the cost in another, as it varies from house to house in the same area. If the unit be broken, there would be no end of rate-making. No logical line could well be drawn mile by mile through a service area. As the Commission said, 'the question is inseparably bound up with questions of broad public policy'."

End-of-Period Rate Base

The Virginia court's decision on the use of a so-called "end-of-period rate base" is just as applicable to telephone companies and other utilities as to the electric utilities in this case. For those not familiar with the Virginia rate case practice—this commission follows the procedure of using an original cost of property rate base as of the very last day of the so-called "test period" so as to reflect increases in plant investment during a period of rising prices. This is the nearest the Virginia commission came to recognizing current costs or reproduction costs. It is admittedly pretty far from being the same thing. But at least it is better than tying the rate base down to an *average* investment figure, based on the entire test period. Here is what Justice Spratley had to say on this point:

"The commission fixed a year-end rate base in accordance with its practice in former rate cases such as this, rather than a rate base predicated on the net average investment for the test period. In fixing rates for the future, the use of the end-of-period rate base provides for revenue which is directly related to plant investment

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REA APPROVES SEVEN NEW TELEPHONE LOANS

The U. S. Department of Agriculture on Apr. 27 announced that the REA approved $2,791,000 in loans to seven telephone systems for improved and expanded service in rural areas of South Dakota, Minnesota, North Carolina, Missouri, Tennessee, Wisconsin and Montana.

On Apr. 18 Midstate Telephone Co., Kimball, S. D., was allocated a loan of $873,000, which will be used to finance the improvement and extension of rural telephone service in Aurora, Brule, Buffalo and Jerauld counties.

The borrower, a new cooperative organization, proposes a modern telephone system in south central South Dakota to serve a total of 1,353 subscribers.

The following acquisitions will form the nucleus for the new system: The Kimball and White Lake exchanges from the Central Telephone Co., Lincoln, Neb.; the Stockman-Farmer Telephone Co. of Gann Valley, S. D.; the Home Telephone Co. of Pukwana, S. D.; and 13 small companies now being switched by the acquired exchanges.

These telephone properties are now serving 807 subscribers, including 284 switchers, over 495 miles of line.

About 630 miles of new line will be constructed and 199 miles of existing line rebuilt. The Gann Valley, Kimball, Pukwana and White Lake exchanges will be converted to dial operation to serve the new system.

The rehabilitation and new construction will enable the Midstate organization to improve service for the existing subscribers and to serve 546 rural families now without telephones. In addition, 120 switchers in the Kimball, Pukwana and White Lake areas will rebuild their own lines and continue as switchers of the borrower. The new system, when completed, will consist of 897 miles of line.

Joe Knippling is president of the Midstate Telephone Co.

* * *

Halstad (Minn.) Telephone Co., received a loan of $494,000 on Apr. 19 to improve and extend rural telephone service in Norman and Polk counties.

The company now serves 828 subscribers over 317 miles of line, and proposes to acquire the Roome Rural Telephone Co. at Fisher and the Bygland Rural Telephone Co. at East Grand Fork, both presently switched by Northwestern Bell.

These facilities, providing switcher service to 93 rural families over 69 miles, together with the existing Halstad telephone properties, will be rehabilitated and expanded.

About 320 miles of the existing line will be rebuilt, and 73 miles of new line added. The Halstad, Climax, Nielsville and Shelly central offices will be converted to dial operation and a new automatic central office will be constructed at Bygland.

The rehabilitation and new construction will make it possible for the Halstad company to offer improved service to the existing subscribers and to serve 165 additional rural families in the community who are now without telephones. The completed system will consist of 417 miles of line.

A. M. Hastad is president and C. T. Estenson is manager of the Halstad Telephone Co.

Also, on Apr. 19 Lower Cape Fear Telephone Membership Corp., Elizabethtown, N. C., received a loan of $346,000 to improve and extend rural telephone service in Bladen and Columbus counties.

The new cooperative proposes to construct 289 miles of line and new automatic central offices at Abbottsburg, Lisbon and White Oak to serve 847 new subscribers who do not now have telephone service.

J. R. Powell is president of the Lower Cape Fear Telephone Membership Corp.

* * *

Silex and Eolia Telephone Co., Bowling Green, Mo., on Apr. 20 was given a loan of $183,000 to finance the improvement and extension of rural telephone service in Lincoln and Pike counties.

The company now serves 62 subscribers and 176 switchers in the Silex exchange area, and 133 subscribers and 49 switchers in the Eolia area.

The loan funds will be used to provide more dependable service in the Silex community only. New automatic central office equipment will replace the magneto facilities in the Silex office, and 150 miles of new line will be constructed.

The changes will make it possible for the borrower to offer improved service to the 62 subscribers in the Silex vicinity and to serve 308 additional rural families now without telephones. This includes the switchers who will become regular subscribers of the Silex and Eolia Telephone Co. This section of the system, when complete, will consist of 151 miles of line.

W. R. Buchanan is president and manager of the Silex and Eolia company.

* * *

On Apr. 20 Friendship (Tenn.) Telephone Co., was allocated a loan of $450,000 to improve and expand rural telephone service in Crockett, Dyer and Haywood counties. The borrower, now furnishing magneto service to 276 subscribers, plans to enlarge the service area to serve an additional 850 subscribers.

The Friendship company will acquire the Maury City Telephone Co. and the Crockett Mills Telephone Co. These facilities are now serving 507 subscribers over 105 miles of line.

About 114 miles of the existing line will be rebuilt and 101 miles of new line and other facilities added to serve 343 rural families in the area now without telephones.

New automatic central offices will be constructed at Maury City and Friendship. The completed system will consist of 258 miles of line, furnishing dial service to 1,126 subscribers in the enlarged operating area.

Max M. Earnheart, Sr., is president and manager of the Friendship Co.

* * *

Coon Valley (Wis.) Farmers Telephone Co., received an allocation of $364,000 on Apr. 20 to improve and expand rural telephone service in Vernon county.

(Please turn to page 39)

Corrosion (Electrolysis) of underground cables

by
Harold B. McKay

This is a section of sheathing from a cable which failed because of electrolysis. The small pockmark holes are the result of tiny sea shells in the soil, which focused the corrosion at these points.

"Earth to earth, ashes to ashes, dust to dust . . ."—Book of Common Prayer

PHYSICAL MAN and all of his works spring from the earth, and to the earth return, as the old prayer tell us. This applies to underground cable sheathing along with everything else. Lead, like most other metals, is found but rarely in metallic form. It is mined in the form of a chemical compound, usually lead sulphide, which is subsequently smelted or refined in order to obtain the metal.

However, as soon as man has thus obtained his metal, the inexorable forces of nature commence to destroy it and return it to earth. Even the smokestack of the smelter may contain oxidized metal which has already become ashes and dust. The metal that survives may be put to a variety of uses, but the forces of nature always lurk near to reclaim it. Man, if he would keep his possessions, must constantly battle these forces of nature.

These articles are intended to help in man's efforts to save his underground cable by presenting a simplified explanation of the electrical and chemical processes involved in corrosion, and an outline of the preventive and remedial measures used in meeting the problem. Unfortunately at this writing, no sure physical cure can be offered that will save man's cables anymore than such a cure can be offered that will prevent man's other goods, including his own aching joints, from corroding with time.

Electrolysis

The word "electrolysis" is heard frequently in connection with the corrosion of lead cables, although it is not always used with accuracy. Simply stated, the word means conduction of electricity by a fluid. The Webster dictionary definition is "The act or process of conduction of an electric current by an electrolyte through the presence in the electrolyte of the charged parts, ions, of the dissolved substance."

The electrolyte in turn, is defined as "A type of electrical conductor in which, when traversed by an electric current, there is a liberation of matter at the electrodes, either an evolution of gas, or the deposit of a solid."

Simply stated, this means that an electrolyte is a fluid which will conduct electricity, because of some substance which is dissolved in it. The dissolved substance may be a carefully controlled chemical in the case of the manufacture of a battery, or it may be the back wash of a leaking sewer in a telephone company manhole. The principle is the same; only the odor is different.

Out of the above definitions and other similar ones a significant fact can be developed—that is that chemical changes, such as corrosion, have an electrical feature to them. A tin can rusting in a vacant lot is generating electricity as well as rust; pipes and cables buried in the ground are also sources of potential. Even the fillings in man's teeth may develop the "taste" of electricity.

The complex electro-chemical rela-

FIRST OF A SERIES

This is the first of a series of six articles discussing the fundamentals of corrosion and its effect on underground cable. To our knowledge, it is the first detailed discussion on this subject, directly applicable to telephone cable, published in many years.

We feel we are fortunate in securing the services of an engineer of Mr. McKay's experience and knowledge to present a down-to-earth explanation of the causes and effects of corrosion, an old-age problem in connection with telephone underground cable plant.

Mr. McKay will be remembered for his series of articles on "Principles of Microwave Operation" and "Electrical Principles Used in Carrier System" and other articles published in TELEPHONY.

tions involved in corrosion of underground cable is a fascinating subject, which can take a researcher far into the realm of chemical as well as electrical engineering, with a side trip into the structure of matter. However, all of this can be greatly abbreviated and a few simple rules given which will be of assistance in fixing the trouble, which, in the final analysis, somebody has to do.

Basic Rules

The following conditions must exist for electrolytic action or corrosion to occur:

(1) There must be two conductors of electricity, each made of a different material, or of a different electrical potential or polarity.

(2) There must be water, in which there are dissolved impurities.

(3) There must be a third conductor of electricity, which is located in a position where it will carry current between the two conductors mentioned in the first item.

All three of these conditions must exist for corrosion to occur, but these conditions may come about in surprising simple ways. These conditions are present when an ordinary dry cell is connected to a load, or shorted. As the battery discharges, the zinc plate corrodes.

About 150 years ago, Alessandro Volta, the man for whom the volt is named, demonstrated this same principle by taking two coins, each of a different metal, and placing one on each side of a piece of moistened fiber, and showing that a voltage was developed between the coins. A stack of coins so arranged produced the world's first battery—the voltaic pile. In the early days of crystal radios, similar batteries made of two coins were used by experimenters to test the sensitivity of their ear-phones. The reader is urged to duplicate this little experiment, shown in *Fig. 1.1* using either a telephone receiver or a sensitive meter to demonstrate that two pieces of different metals and a little saliva do generate electricity. This stunt, more than any words, demonstrates vividly just what any piece of metal is up against when it is buried in wet soil.

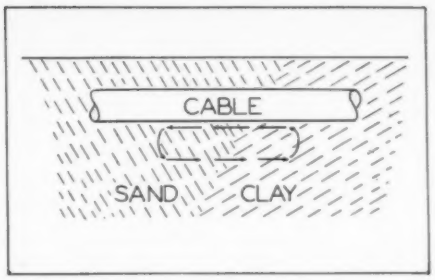

Fig. 1.2. When a cable runs through different kinds of soil, a different electrical potential may develop in each section. These two different voltages form a battery cell, which is shorted by the cable. This causes current to flow from the soil to the sheath and back as shown by the arrows, thus causing corrosion.

While this experiment uses two different metals, and thus makes the principle very clear, the rule mentioned that any two conductors of electricity would do the same thing. In the case of our cables, two different kinds of soil may serve as the two conductors, and the cable may be only the third conductor which is shorting the others out.

Different Soils

If, for instance a buried cable passes through wet clay and wet sand, the electrical potential developed between the cable and the clay will be different from that developed between the cable and the sand. Because of the difference of potential, the voltage along the cable sheath will be higher in one place than in another, and current will flow along the sheath, and between the soil and the sheath as shown in *Fig. 1.2*.

Another way of looking at this is that the two soil masses comprise a wet cell or battery, which is shorted by the cable that passes through it. Note that this is strictly an "earth current" which flows in the sheath and the soil. It has nothing to do with any current which may be flowing inside of the cable.

Even cables that are enclosed in conduit can experience the same sheath current. A metallic conduit or pipe automatically forms a battery when it contains a lead cable, and it takes only moisture to start generating current.

But the conduit does not have to be metallic. No matter of what material the pipe is made, if water gets into it, the chemical composition may vary in different parts along its length because of impurities in the water. This creates the same effect as the different soils as mentioned above. The potential developed at one spot in the pipe will be different than at another spot, because of the different chemicals. Where a difference in potential exists, one will be positive with respect to the other and current will flow.

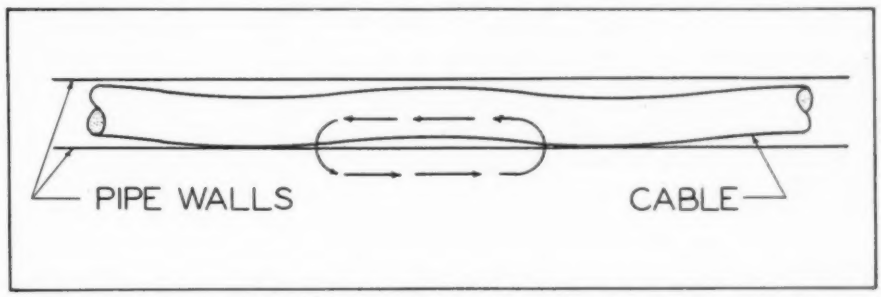

Fig. 1.3. A cable in a conduit which also contains moisture and soil impurities can develop "local action" as illustrated by the arrows. This current flow travels from the cable to conduit and back in one little spot, and ordinarily cannot be measured at the manhole or ends of the cable.

Fig. 1.3 illustrates how current can flow in a "local circuit" completely within a conduit when moisture is present. In these cases the circuit may be completed by actual contact between pipe and cable, and by passage of current through the fluid in the pipe.

Note that in both of these examples, the current in the sheath is localized in a concealed portion of the cable. This condition would not show up electrically in tests which might be made at other parts of the cable, such as at manholes. Hence it is sometimes called "local action" to distinguish it from electrolysis or corrosion currents

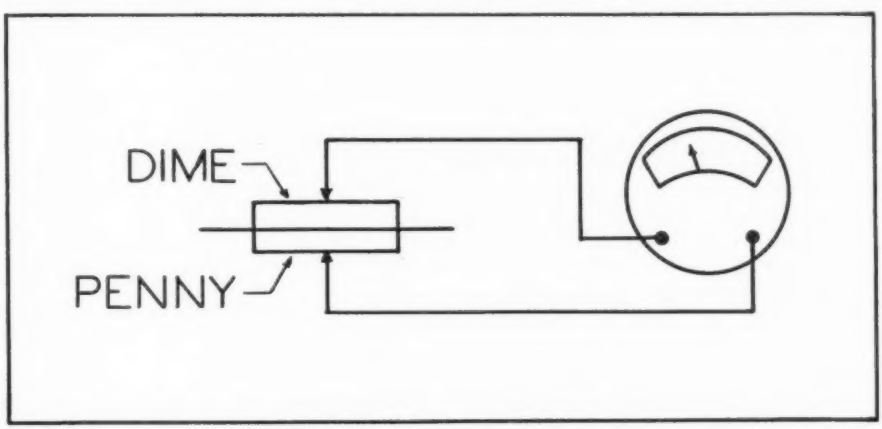

Fig. 1.1. Two pieces of different metals, such as two coins, when separated by a piece of moistened paper will develop a current which can be measured on a sensitive meter, or heard with a telephone receiver. (All drawings in this series are by Victor Willard.)

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that may be present over a considerable length of cable sheath.

Positive Pole Corrodes

It is this sheath current which causes corrosion of the cable, and this corrosion follows a definite rule which must be remembered. The rule is that the positive pole corrodes. As with so many things, there are exceptions to this when there is alkali from cement or other sources present, but for the moment we will consider only positive pole corrosion. This phenomenon may be noticed wherever positively poled electricity comes in contact with moisture or chemicals. The terminals of the storage battery in your car provide an example. Unless protected with grease, the positive terminal will corrode.

Why always the positive terminal? The answer to this is one of those things that goes into physics and the structure of matter, but it can be thought of in a simple way. Assuming that electricity travels from positive to negative, it may be said that when the current leaves a piece of metal to enter a fluid it takes some of the metal along with it. This removed metal combines with the fluid, and a chemical compound results. This compound may dissolve in the fluid or be carried away in the soil, or it may pile up as crystals or a powder at the terminal of the battery.

There are some common every-day applications of this principle, in which it is put to good use. One is the matter of electroplating. In this art, a metal electrode, such as silver is placed in a solution along with the object to be plated. Current is then applied which removes metal from the electrode and carries it through the solution and deposits it on the object to be plated.

"Dry" Cell

Another example is the ordinary dry cell, such as is used in your flashlight battery. This consists of a zinc container filled with a chemical, in the center of which is a carbon rod. In spite of the name "dry" cell, the chemical is not dry, but actually wet, as you will find out if you leave it in your flashlight after holes have been eaten in the zinc container.

The actual reactions that take place in a battery cell furnish a good explanation of the factors present in the corrosion of anything. A simple battery can be made by using two different strips of metal, such as copper and zinc, which are immersed in a glass of sulphuric acid. The sulphuric acid is composed of the chemical elements, sulfur, hydrogen and oxygen. When this acid attacks the zinc in the battery, the sulfur and oxygen combine with the zinc, and a compound, zinc sulfate results which is dissolved in the fluid. The hydrogen from the acid travels to the copper strip when the sulfur and oxygen go to the zinc.

The hydrogen would collect in such a battery in little bubbles all over the copper strip and form an insulating layer. While this feature is of no immediate significance to our present discussion, this is an interesting thing to remember, because this gathering of hydrogen bubbles, called polarization, is the reason a battery can go dead, and later come back to life when the bubbles disappear.

Simple Battery

In the simple battery shown below, electricity is developed because all substances may be regarded as electrically balanced. A substance may contain both positive and negative characteristics but these will be ordinarily balanced—that is the positive just balances the negative. This is true of sulfuric acid. The hydrogen in the acid is a positive quantity; the sulfur and oxygen together form the negative quantity. When the chemical reaction described above takes place, it might be said that this balance is upset, or broken apart. One way of thinking of this is, say that the hydrogen bubbles take the positive charge to the copper terminal, and the sulfur and oxygen take the negative charge to the zinc terminal. Thus, the polarity of the battery terminals is established.

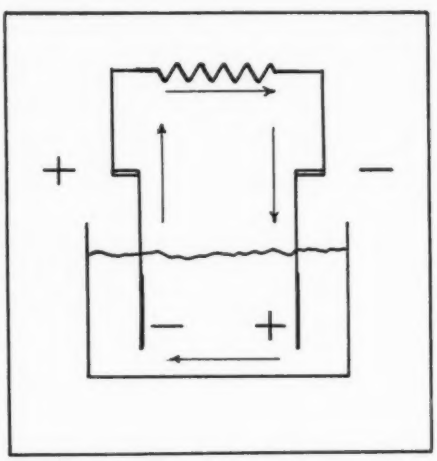

Fig. 1.4. This illustrates a simple battery cell, with two plates immersed in a fluid, with a resistance load connected across the terminals. Arrows show the direction of current flow. The terminal which is positive on the outside is equivalent to negative on the inside of the cell. Positive terminal is the one that corrodes, so that inside, the right hand plate will be consumed. Outside if moisture and a leakage path are present, left-hand terminal will corrode.

Now, there is an interesting further result of all this. When the sulfur and oxygen reach the zinc, some of the zinc leaves the plate to combine with the sulfur and oxygen to replace the missing hydrogen and form the zinc sulfate compound. Thus the zinc gradually corrodes away and disappears. Note that the zinc, though it is the negative pole of the battery, supplies a positive value to make the zinc sulfate in replacing the positive hydrogen.

If this battery is connected in a simple circuit as shown in *Fig. 1.4*, the current will flow from positive to negative as shown by the arrows. Note that while the copper plate is positive as far as the outside circuit is concerned, inside of the battery the current is flowing from the zinc to the copper. Hence, inside the battery the zinc is really the positive terminal with respect to the fluid. Because the current leaves the zinc to enter the fluid, and takes zinc with it, the zinc corrodes. This is the reasoning behind the earlier statement that it is always the positive pole which corrodes.

Closed Circuit

The seeming conflict wherein the zinc plate is shown to be both positive and negative may be resolved when it is remembered that there is only one current flowing, in one direction—a circle. Positive and negative then are directions, rather than points. Positive is counter-clockwise in our drawing and negative is clockwise. Whether one goes from negative to positive, or vice versa, depends on the direction traveled.

Another way of looking at this is to remember that in a string of cells, like the central office battery, the binding post of any one cell is both positive and negative, depending on the way you look at it. It is the positive pole of one cell, and the negative of the next one to which it is connected.

The last cell on the string may be negative, but follow it through the central office load and it connects to the positive also. Break any electrical circuit at any point and one end of the cut wire will be positive, the other negative.

If the foregoing explanation appears burdensome it has been only because this point is one of the most frequently misunderstood features of basic electricity and a straight concept of it is necessary before considering the next step, which is the relative potentials between different kinds of materials. As will be shown later, successful combat of electrolytic corrosion of cables depends upon the experience and knowledge of the cable maintenance personnel rather than upon precise engineering principles.

Electromotive Force Table

In the battery described above, it was stated that the copper was the

(Please turn to page 40)

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

WHEN an automatic conversion job is not handled properly there may be resentment from at least a part of the customers. Not that manual service is preferred over dial service, but resentment may come from the release of favorite operators. The operator continues to be most powerful in many small communities and her passing seldom meets unanimous approval.

This problem can best be handled by first advising all employes about the conversion plans. Often operators may be transferred to another position prior to the conversion. Moreover, they may be transferred to another exchange, a toll board or perhaps to a clerical position in the commercial or plant departments. New operators may then be hired to serve only until the new equipment is placed in service. The release of these temporary operators should never cause difficulty. Perhaps some of the plant men may also be transferred or retrained for work with the dial equipment.

Next, the key community leaders should be advised of the conversion plans and they should also be made familiar with the contemplated improvements in service. If these men are sold on the idea and made to understand that they are a part of the plan, the problems of the telephone company will be made somewhat easier. This is especially true when an increase in rates is involved in the conversion.

Then and not until then a news story should be released advising the general public as to the planned conversion and changes to be made in the telephone system. This program need not be a long drawn out affair, but all of the parties involved might well be advised in a single day. In no case should this program cover over two or three days at the most.

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The telephone proved invaluable during the recent construction of the world's largest warship, the U.S.S. Forrestal in a Newport News, Va., shipyard. Twenty-three telephones were used at dockside and on ship during its construction period. For the christening ceremonies, two telephones were installed on each side of the carrier to facilitate undocking.

One was also installed at the sponsor's platform, one in the public address enclosure, nine for the use of the press, one for the chief operator, and two in the material station for emergency calls.

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The writer recently was privileged to witness a most interesting demonstration of a high speed printer designed for use with the UNIVAC electronic computing system.

This device reads the magnetic tape and prints on paper up to 78,000 characters per minute. The high-speed printer offers a selection of 51 characters—letters, numbers, and punctuation marks on a line 130 characters wide. Its extreme versatility permits printing, in any format desired, on sprocket-fed paper—either blank or preprinted—from 4 inches to 27 inches wide.

This equipment can print 7,500 paychecks, monthly statements, etc., in less than an hour. It would appear that the device has definite future possibilities for centralized billing and accounting for various large utility companies and, in fact, all business concerns.

It would seem ideal for use in connection with the decentralization of industry in this country. It will likewise increase the requirement for point-to-point electrical communication.

• • •

We recently had a report of the failure of cone type earth anchors on a certain important construction job. An investigation disclosed that these anchors had been set in a wet swampy location without having used any crushed stone. The cone type should not have been used in this location in the first place as a swamp type anchor was required. Therefore, the anchors just did not have a chance.

There are various excellent types of patent anchors on the market today. However, in every instance, a proper type of anchor should be selected for use in a particular soil condition. If this is done, and the anchor is set in accordance with the manufacturer's instructions, a satisfactory job may be expected in each case. Certainly, in the great majority of cases of unsatisfactory anchor performance that we have investigated, we have found either the wrong type has been used or the anchor has not been set properly.

• • •

We recently enjoyed reading "Notes on Nationwide Dialing," prepared by the Operation and Engineering Department of the AT&T and the Bell Laboratories.

This book contains a wealth of information concerning the national numbering plan, and the switching plan for operator and customer direct distance dialing. It is good to have a central source of authoritative information on this most important and ever changing feature of modern telephone communication.

It is understood that this book will be changed as required to keep it up-to-date at all times.

• • •

Over in Maryland recently six plant employes of the Chesapeake & Potomac Telephone Co. became members of the Wise Owl Club. This club is sponsored by the National Society for the Prevention of Blindness and membership is granted only in those cases in which loss of vision due to flying objects has been prevented by the wearing of safety goggles.

The experiences of these men prove beyond all argument that the safety protection of goggles certainly pays off.

XUM

IOWA INDEPENDENTS

Urged to "Sell" and Convert Exchanges

By R. C. RENO

MERCHANDISING of telephone service and special facilities, telephone company advertising and conversion of exchanges to automatic operation were three of the main topics emphasized at the 59th annual convention of the Iowa Independent Telephone Association, held on Apr. 12 and 13 in Des Moines.

The convention was opened by an address by the association's general counsel, Clyde McFarlin, president of the Montezuma (Ia.) Mutual Telephone Co. and chairman of the Employment Relations Committee of the United States Independent Telephone Association.

Mr. McFarlin covered various legislative bills pending before the Iowa legislature affecting the telephone business and discussed the proposals to increase the federal minimum wage.

The general counsel told the delegates that, with an increase in the minimum wage, conversion of manually operated telephone exchanges to automatic is the "only answer and salvation of small telephone companies." He urged immediate consideration of conversions by those companies which are not already contemplating such moves.

Another subject covered by Mr. McFarlin was the matter of securing franchises to operate in the cities and towns served by Independent companies. He stated that a telephone company franchise is very much different than power company franchises, and it is not enough to have attorneys draw up franchises which follow the provisions of power company agreements. He urged telephone companies to employ attorneys who can prepare franchises under which they can operate successfully.

"The matter of securing a franchise is a highly technical matter and the subject matter of your franchise is very important in securing credit. This is one matter on which you need the best legal talent available, and you must have an attorney in such matters if you wish to avoid further legal and financial difficulties," Mr. McFarlin stated.

Leon F. Roberts of Washington, D. C., Director of Information of the United States Independent Telephone Association, presented a report of the activities of the national Independent association dealing with industry affairs on a national level. He particularly emphasized the USITA national advertising program to acquaint the general public about the Independent industry and he urged that all Independent companies support the program. He said:

L. F. ROBERTS, USITA Director of Information, addressing the Iowa convention.

"Advertising doesn't cost—it pays.

"Why advertise? Because you have something to say about your business that should be widely known. Any firm has little legitimate reason for being in business—and faint hope of staying in business—that feels it has nothing worth saying about itself.

"Advertising is communications. Advertising is the cheapest form of business communication ever devised. Advertising is a specific means of communication, as a letter, a telephone call, or a salesman's call.

"Why advertise? Well, why telephone?

"Advertising is public relations. The national advertising program was launched by your association as part of a planned public relations program —a long-range program—designed to create universal good-will for the Independent telephone industry, and that means good will for every Independent telephone company—large, medium and small—in the land.

The Tom Griffith Chapter of the Independent Telephone Pioneer Association sponsored a luncheon meeting which was attended by Iowa state legislators and state officials. M. R. Thompson of Toledo, Ia., president of the chapter, presided over the Pioneers' business session and Mr. McFarlin was toastmaster for the remainder of the luncheon meeting.

The featured speaker of the meeting

Members of the panel taking part in the Sales Symposium held at the Iowa convention. Left to right: W. P. HOLLIS, sales manager of Kellogg Switchboard & Supply Co.; L. H. WARNER, president of Leich Sales Corp.; R. B. WISEMAN, manager of the Telephone Division of North Electric Co.; M. R. THOMPSON of Toledo, Ia., moderator; H. C. SMITH, vice president of Automatic Electric Sales Corp., and T. C. THOMPSON, sales manager of the Telephone Division of Stromberg-Carlson Co.

was Harold W. Brenton of Des Moines, president of the Brenton Banks.

Mr. Brenton first reminded his audience of the wisdom and foresight of the founding fathers of our country in setting forth a pattern of business and private life in the preamble to our national Constitution which he quoted as follows:

> "We, the people of the United States, in order to form a more perfect Union, establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America."

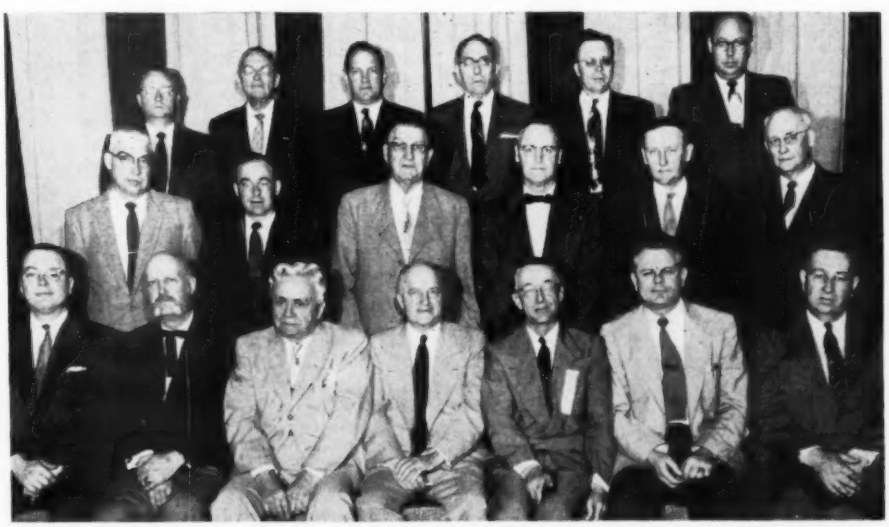
The tremendous strides made by our country, especially when compared to dictatorships, he attributed to the fundamentals set down in this code. No organization or government can prosper without a sound fundamental plan. Our way of life, Mr. Brenton continued, can be divided into four mutually related and dependent aspects, namely, science, incentive, sales, and finance.

He went on to show in some detail how each of these was in part responsible for the progress and development of our country and how freedom to pursue these avenues of endeavor has made us so different from the totalitarian state and has produced for us the highest living standards in history.

An address by Walden E. Piehn, president of the Harmony (Minn.) Telephone Co., on the subject, "Magneto to Dial," opened the session following the luncheon meeting.

Mr. Piehn told of steps taken in the program of converting the Harmony exchange to automatic operation and in working with switch-line subscribers in rebuilding their facilities. His address will be presented in full in a future issue of TELEPHONY.

The remainder of the session was given over to a "Sales Symposium" of which M. R. Thompson of Toledo, Ia., acted as moderator.



Officers and directors of the Iowa association. Back row, left to right: L. E. TRAVIS of Newton; VERNE CLARK of Ford Dodge; JOHN J. McINTOSH of Cedar Rapids; J. L. TREVILLION of Chariton; ROSS VERNON of Sioux Center, and ARTHUR SANDERS of New London. Middle row, left to right: HAROLD THOMPSON of Clear Lake; H. FILMORE MELICK of West Liberty; J. A. SCHUTTLOFFEL of Walnut; HOWARD AMICK of Des Moines; ARTHUR LONG of Sloan, and LOYD MORRISON of Grinnell. Front row, left to right: W. F. MILLER of Des Moines; C. C. PEARCE of Riceville; W. H. FOWLER of Pella; CLYDE McFARLIN of Montezuma; V. D. PECK of Primghar; E. G. CARLSON of Creston, and ROY BRANDEL of Mount Pleasant. Directors missing from picture: EARLE BELLAMY of Knoxville; A. L. KELLEY of Clarinda, and E. B. ZERWAS of Manning.

Participants in the panel were representatives of the major Independent telephone manufacturers—W. P. Hollis, sales manager of Kellogg Switchboard & Supply Co.; Harrison C. Smith, vice president of Automatic Electric Sales Corp.; T. C. Thompson, sales manager of the Telephone Division of Stromberg-Carlson Co.; L. H. Warner, president of Leich Sales Corp., and R. B. Wiseman, manager of the Telephone Division of North Electric Co.

Moderator Thompson opened the discussion by stating that telephone people should stop being "order takers" and go out and sell their regular exchange and toll service as well as special services and facilities. He said this is the only way for telephone companies to get their share of the consumers' dollars being spent and is, in a large measure, the key to survival.

Mr. Hollis urged telephone companies to put on a campaign to sell wiring plans, intercommunications facilities other than PBX's. He recommended that a survey of present customers and prospects be made to ascertain their needs for additional facilities of this kind.

Mr. Smith covered the sale of PBX's and PABX's to local business establishments. He said the "telephone door" to these concerns is just as important as the "front door" and that adequate telephone facilities to allow firms to service "telephone" buyers will help them increase their profit and step up their efficiency.

T. C. Thompson urged telephone companies to sell such items as telephone answering devices, secretarial services, directory advertising, sound and paging systems, (either separate or as parts of PBX or PABX systems) and telemetering systems. He also emphasized the need for the installation of outside paystations to increase telephone companies' revenues.

Mr. Thompson also discussed the rendering of mobile telephone-radio service and the installation of micro-

wave systems to serve remote rural areas.

Special effort to sell colored telephones, hard-of-hearing sets, extensions, lighted dials, "no hands" telephones, loud ringing bells, chimes and visual signals, was urged by Mr. Warner. He stated that any selling campaign should be based on the cooperative effort of every telephone company employe to supplement any advertising and promotional work carried on in the campaign.

Mr. Warner pointed out that Independent companies in general have dragged their feet in merchandising their services and selling must be the "order of the day" if they are to increase their revenues.

Mr. Wiseman discussed the use of subscriber line carrier as a means of increasing subscribers and rendering more service over existing plant, particularly in out-of-the-way places where physical plant cannot be built economically. He predicted that the transistorized subscriber line carrier will be available to Independent companies within a relatively short period of time.

In his annual report, the association's secretary-treasurer, W. F. Miller, tracing some of the activities of the association during the last 12 months, reported that the association's five Small Company Committees held 10 district meetings, which were attended by Independents representing 466 exchanges. In addition, he said, the Small Company Committees held an average of one meeting per month as a part of their program to help smaller companies solve their operating problems.

In connection with the small company aid program, the association is preparing an outline or check list of the steps which should be taken in dial conversion programs. This outline will be printed and distributed to small companies, Mr. Miller reported.

Commenting upon the dial conversion program in Iowa, he said:

"There are approximately 150 automatic exchanges in the state. The fact that the bulk of these conversions have come within the last three or four years attests to truly remarkable progress.

"Just about a year and half ago, the dial conversion pace in Iowa looked like it would take 19 to 20 years to convert all the Iowa exchanges to dial. Today, with the increased tempo, that estimate is now down to about 11 years. Who can say, perhaps at next year's convention the picture will have changed so that it will only be about seven years from that time?"

Following Secretary Miller's report, an Insurance Symposium was held. Samuel Orebaugh, Deputy Commissioner of Insurance of Iowa was the moderator. Panel members were Charles DeWinter of Des Moines, regional group manager of the Bankers Life Co.; F. E. Ginn of Des Moines, Iowa field supervisor of Employers Mutual Casualty Co.; M. C. Leonard of Lincoln, Neb., director of insurance of the Central Telephone Co., and F. W. Strouce of Des Moines, vice president of Hawkeye-Security Insurance Co.

The secretary of the Iowa association, W. F. MILLER (left) and President E. G. CARLSON, inspect a microwave radio display at the association's convention.

Following the insurance symposium, Gene Daubendiek of Jefferson, Ia., chairman of the Iowa association's Plant Committee gave a report of the work of that group.

One of the activities is the preparation of a central office grounding specification which will soon be available to Iowa Independents.

The Plant Committee sponsored a cable installation and splicing school held at Iowa State College last December. Concerning this school, Mr. Daubendiek stated:

"The plant school is one of our continuing efforts toward training and educating telephone people in modern practices and advanced techniques. Registration was limited to 30 students. Tuition fees, which covered the cost of board and room, materials and supplies, etc., was set at $65. Various materials, supplies and tools were advanced, for use by the school, by various manufacturers, sales representatives, and individual member companies of the association. Instructors for the school, eight in number, were all experienced first-class cable men and were picked from the Plant Committee's regular operating forces. Two manufacturer's representatives were included in the instructors' complement."

WALDEN E. PIEHN, president of the Harmony (Minn.) Telephone Co., telling Iowa Independents about the program of converting the Harmony exchange to automatic operation.

The Plant Committee plans to hold another school sometime this year, Mr. Daubendiek stated.

Association President E. G. Carlson emphasized the need for Independent companies to institute service selling campaigns in all of their exchanges. Stressing the need for the training of all employes to sell, Mr. Carlson stated:

"We in the telephone industry management have been weak in the training of our business office and plant employes. In fact all of our employes should be trained to recognize the things a customer needs and he should know all of the services his company has available. Your employes are your best salesmen if they are doing their job. They can also be your worst salesmen if they have not had the proper training. They should also be convinced in their minds that the telephone service they are selling is the biggest bargain on the market."

He cautioned his listeners not to overlook rural subscribers in selling extra service. "The farmer needs and wants the service we have to sell, but he doesn't know it unless we tell him," Mr. Carlson said.

Another subject discussed by the president was the importance of improving collections. On this point he said:

"All of us have subscribers who do not pay bills promptly. Some of them will not pay at all unless you make an effort to collect from them. In most cases, it is easier for a subscriber to pay a one-month telephone bill, than

(Please turn to page 42)

Guard your splices right with these

REG. U. S. PAT. OFF.

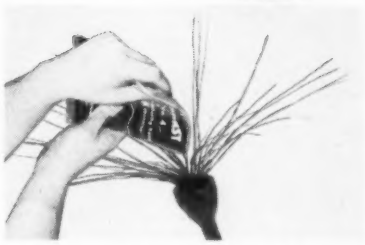
SCOTCH BRAND Electrical Products!

Approved for splicing plastic communications cable

"SCOTCH" Brand Plastic Tapes—the *original* plastic tapes. First developed and perfected in our own laboratories. Made to exacting quality standards. Tough, impervious vinyl plastic. Two thicknesses available: 7 mils (No. 33—the standard of all plastic tapes) and 10 mils (No. 22—for extra abrasion resistance).

"SCOTCH" Brand Aluminum Tape — has special adhesive to insure an effective moisture barrier. "SCOTCH" Electrical Tape No. 49 is available in 2 inch by 20 foot rolls.

"SCOTCHFIL" Electrical Insulating Putty —a putty in tape form. Application is clean, rapid, economical. Excellent as a fast build-up for cable splices. Long life, stays firm and flexible, doesn't dry out or become hard and brittle.



"SCOTCHCAST" in "Unipak" Container—casting resin and hardener in plastic double bag. Knead to break inner bag and mix hardener with plastic, then pour. Sets in a few minutes, provides a perfect moisture seal. Makes impervious moisture blocks in cable ends. Especially recommended for splicing lead sheathed cable to plastic sheathed cable.

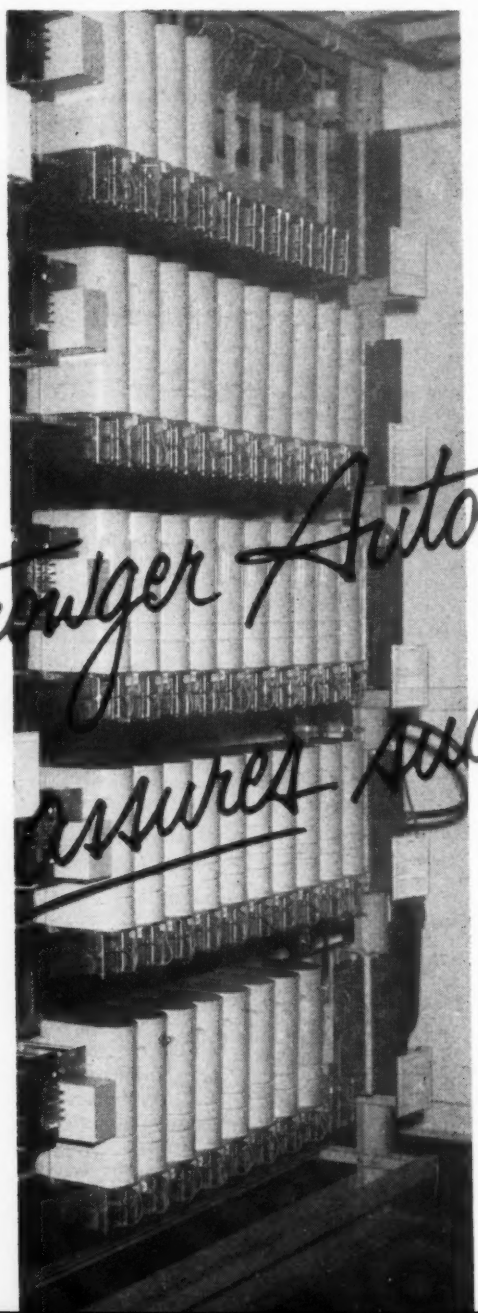
Above products are approved for use in REA splicing procedures PC-2 and PC-3. Available at your wholesaler. Further information and copies of splicing procedures will be sent free on request. Write Dept. GQ-55, Minnesota Mining and Manufacturing Co., St. Paul 6, Minn.

The term "SCOTCH" and the plaid design are registered trademarks of Minnesota Mining and Manufacturing Company, St. Paul 6, Minn. Export Sales Office: 99 Park Avenue, New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

3M COMPANY

Successful telephone men take no unnecessary chances. In selecting switching equipment, for example, they know there's no need to gamble; that's why they buy Strowger Automatic. They buy it on its record—they know what it will do!

Why Ga



Strowger Automatic assures success!

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No unfounded claims, no vague euphemisms are necessary to sell Strowger. The record of many years shows irrefutably, conclusively that:

Strowger Automatic Maintenance Costs Less. Circuits are simple — permit fast routining by less costly, semi-skilled men. Wearing parts are few and are quickly, easily and inexpensively replaced. Strowger Automatic is expertly made — stays trouble-free, needs little care.

Strowger Automatic is Unequalled for Dependability. Now and then an old Strowger exchange is replaced with more modern Strowger Automatic equipment containing the latest circuits. But no Strowger Automatic exchange has ever worn out!

Strowger Automatic is Unequalled for Flexibility. Each switch is complete with its own control relays. All switches can be easily jacked in or pulled out as needed. Result: simplicity and speed in changing trunking and modifying traffic patterns.

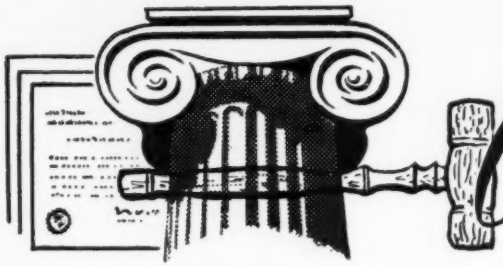
Strowger Automatic Grows Economically. You merely add switches, shelves, or complete frames — the initial equipment and existing service are not disturbed. You meet every growth requirement economically.

Strowger Automatic provides the most Modern Toll Service. Intertoll connectors, automatic toll ticketing, digit-absorbing switches — every facility for both operator and subscriber toll dialing — have been developed by Automatic. And all have been *proved* dependable in the field.

Don't gamble your company's money and its future, choose Strowger Automatic for *assured* success. Start by arranging a helpful engineering conference with us. *Address: Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or, call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

ORIGINATORS OF THE AUTOMATIC DIAL TELEPHONE



Courts and Commissions

Mass. Commission Upholds Company's Refusal to Serve

"Allnews Publications, Inc.," Boston, petitioned the Massachusetts Department of Public Utilities on Feb. 16 for an order requiring the New England Telephone & Telegraph Co. to furnish it with telephone service. At a public hearing on Mar. 15 it was agreed that application made to the telephone company had been met by a refusal to install the equipment. It appeared that the police commissioner of Boston had requested the company to deny service to "Allnews Publications, Inc.," in the belief that "such telephone service, if furnished, would be used for an illegal purpose, viz., gaming."

The telephone company was sustained in the commission's finding on Apr. 13. The commission quoted the company's regulation in force for some time, which states:

"The service is furnished subject to the condition that it will not be used for an unlawful purpose. Service will not be furnished if any law enforcement agency, acting within its jurisdiction, advises that such service is being, or will be so used in violation of law. If the telephone company receives other evidence that such service is being or will be so used, it will either discontinue or deny the service or refer the matter to the appropriate law enforcement agency."

The "Allnews" company's counsel endeavored at the hearing to make capital out of the fact that the police commissioner's letter to the telephone company was dated after the filing of the petition with the commission. As to this, the decision said:

"We cannot agree with the petitioner that it is significant. In the first place, the tariff does not require written notice, and it might be a fair inference that the company's original refusal was based at least in part on advice from the law enforcement agency. But, what is more important, the (telephone) company relied upon this letter at the time of the hearing, and if we were to exclude the letter from our consideration and enter an order as prayed for the company would be justified in relying upon the letter in refusing to comply with such order.

"We are not inclined to prolong or duplicate these proceedings, particularly since, as an administrative body, we have always considered that our procedure and point of view should be that of equity rather than law, and that our investigations should be as near current as possible. See *New England Tel. & Tel. Co. v. Department of Public Utilities*, 1954 A.S.701.

"This department held in 1953 in petition of Chick's Variety Store (D.P.U.10,456) that the tariff provision was fair and reasonable and that the department would not place itself in the position of determining a difference of opinion between the police commissioner and an applicant for telephone service. As we pointed out there, sections 14 and 15 of Chapter 166 of the General Laws give the petitioner an adequate remedy before a tribunal which is equipped to determine adversary proceedings of this nature."

"Our functions and duties end when we make the finding, as we do here, that the refusal of the telephone company to furnish service is in accordance with its filed tariffs.

"The questions of fact concerning the good faith of the commissioner's action are respectfully referred to such tribunal for resolution. What may be the attitude of such court in point of law (see People v. Pollack, 120 N.Y. Supp. 2nd 363) is not for us here to consider."

SW States Seeks Arkansas OK On Bond and Stock Issues

Southwestern States Telephone Co., Brownwood, Tex., on Apr. 20 filed an application with the Arkansas Public Service Commission to do some additional financing to help pay for its 1955 construction program.

The company is asking authority to issue $2,000,000 in first mortgage bonds and to sell 40,000 shares of $25 preferred stock.

The application said the company would spend $5,537,000 to improve and expand its facilities in Texas, Oklahoma, Louisiana and Arkansas. Of the total, $880,000 will be spent in Arkansas during 1955.

New York Commission Permits Two Companies to Raise Rates

The New York Public Service Commission on Apr. 28 accepted a tariff amendment filed by Township Telephone Co., Chaumont, designed to increase rates to subscribers of its Dexter exchange effective May 1. The company serves about 900 stations in and near Chaumont, Three Mile Bay and Dexter, through exchanges located in each of the three communities. It converted its Dexter operations to dial service on Apr. 16. Rates for the Chaumont and Three Mile Bay exchanges will remain unchanged.

In seeking its new rates, which will produce about $7,300 additional annual revenue, the company reported it had expended about $140,000 for its conversion to automatic and that unless the new rates were allowed to become effective, its financial situation would be so stringent as to hamper completion of the conversion program now planned for the Three Mile Bay and Chaumont exchanges.

The new rates are as follows: Residence, one-party, $5.50; multi-party and ten-party rural, $4.00. Business: one-party, $8.00; and multi-party, $6.00.

Also on Apr. 28, New York Public Service Commission accepted a tariff amendment filed by Cape Vincent Telephone Co. designed to increase rates effective May 1 when the company proposes to change from magneto to dial service. The company serves about 600 stations in and near Cape Vincent.

In filing its new rates, the company reported that its plant investment, because of the conversion to dial, has increased by about $140,000 during the past two years and that the additional $10,900 annual revenue which will result from the new rates has been necessitated thereby.

The new rates are as follows: Residence, one-party, $5.50; two-party, $5.00; four-party, in the base rate area, and 10-party rural, $4.00. Business: one-party, $8.00; two-party, $7.00; four-party, in the base rate area, and 10-party rural, $6.00.

O. Commission Rules Companies Must Control Telephone Devices

The Ohio Public Utilities Commission has ruled that Ohio telephone companies must have control over all telephone devices to give top-quality service.

The ruling came on Apr. 21 when the commission dismissed a complaint filed

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PENTA

clean, modern wood preservative protects 650 miles of pole line from rot and termites

Section of pole line on Highway 18 near Hurley, S. D., is typical of Dakota Cooperative Telephone Co. project expansion.

650 miles of pole line, like the stretch pictured above, were recently added by the service-conscious Dakota Cooperative Telephone Company. These new poles will be sound and serviceable many years from today . . . they're treated with rot-resisting PENTA* wood preservative.

PENTA poles were specified for this installation because of several important considerations. First, naturally, is the long-term *cost saving:* pole and crossarm maintenance or replacement postponed *for years* because of PENTA's *measurably effective* resistance to decay and insect attack. A second advantage that rates high is the *clean, attractive appearance* these poles have. And how *line crews* appreciate the greater handling and climbing ease.

Over 100 suppliers provide PENTA-treated poles and crossarms carefully checked for proper retentions to give long service life. You can use these same poles to put up the new, low-cost *pole-frame buildings* so popular for equipment storage and other uses. Ask *your* regular supplier about the *tested* benefits of clean *PENTAchlorophenol, approved in REA and RTA specifications for preservation of poles. And for additional information about how simply PENTA protection can actually be *measured*, mail coupon to THE DOW CHEMICAL COMPANY, Midland, Michigan.

THE DOW CHEMICAL COMPANY, Dept. PE 849D, Midland, Michigan

- ☐ Send me more information on PENTA-treated poles and crossarms.
- ☐ Send me details about low-cost, PENTA-treated pole-frame buildings.
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Company_____

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City_____ County_____ State_____

you can depend on DOW CHEMICALS DOW

XUM

by Thomas G. Murray of Washington Court House against the Ohio Bell Telephone Co.

Murray, a vending machine operator, installed a $400 instrument (reportedly a Telemagnet) in his home two years ago to handle business calls in his absence. Ohio Bell cut off his telephone service when he refused to remove the automatic telephone answering device, but a court order restored service.

The commission said Murray was in error when he bought his own answering equipment instead of renting a similar device from Ohio Bell. It held that no one but a telephone company can supply an automatic device to answer a private telephone.

There was no direct connection between Murray's device and his telephone. He plugged the answering instrument into an electrical outlet and set the telephone on top. When the telephone rang, an arm raised the receiver slightly and recorded the incoming call.

Minnesota Commission OK's Six Purchases in April

During the month of April, the Minnesota Railroad & Warehouse Commission authorized:

Purchase of the Granada Telephone Co. by Arthur T. Sparks.

Sale of two telephone circuits between Turtle River and Lavinia owned by the Turtle River Telephone Co. to William B. Carter.

Sale to the Wykoff Telephone Co. of property formerly owned by the Wykoff Cooperative Rural Telephone Co.

Purchase of Bellingham Telephone Co., Laura B. Carpenter, liquidating receiver, by the Farmers Mutual Telephone Co., Cerro Gordo.

Purchase of the Ramsey Suburban Telephone Co., a service station company serving six subscribers (switched from Northwestern Bell's Anoka exchange), by Northwestern Bell Telephone Co.

Cal. Court Says Commission Has Power to Grant Franchise

The California Supreme Court on Apr. 15 held that power to grant franchises for communication services in cities rests with the Cal. Public Utilities Commission rather than the city.

The ruling, which Los Angeles officials estimated would cost the city of Los Angeles 1½ million dollars a year in franchise tax revenues, affects franchises for telephone service. It also would apply to radio, television and other forms of communication services.

It was made on an appeal of the city of Los Angeles in a suit against Pacific Telephone & Telegraph Co., which maintained it was liable to franchise taxes based only on the 1905 boundaries of the city rather than present expanded areas.

In the city's suit, City Atty. Roger Arnebergh sought to force the telephone company to pay franchise taxes on the basis of present boundaries.

Spokesmen for the Los Angeles Board of Public Utilities & Transportation have indicated the city's next step will be to seek an amendment to the state constitution which would give Los Angeles and other cities franchise powers over newly-annexed areas.

A 50-year franchise granted by Los Angeles to the company expired Feb. 8, 1952. At that time the telephone company announced it would agree only to continue paying franchise taxes on areas within the 1905 boundaries of the city because Los Angeles and other cities today do not have the power to grant franchises.

The unanimous ruling was returned in an opinion by Chief Justice Phil S. Gibson.

1955 CONVENTIONS

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 11 and 12.

The Illinois Telephone Association, Pere Marquette Hotel, Peoria, May 19 and 20.

Kansas-Missouri Telephone Associations (joint convention), Town House Hotel, Kansas City, Kan., May 23 and 24.

Pennsylvania Independent Telephone Association, Pocono Manor Inn, Pocono Manor, June 1 and 2.

California Independent Telephone Association, Ambassador Hotel, Los Angeles, June 9 and 10.

New York State Telephone Association, Scaroon Manor Hotel, Schroon Lake, June 13, 14 and 15.

Oregon-Washington Independent Telephone Associations (joint convention), Olympic Hotel, Seattle, Wash., June 17 and 18.

Maine-New Hampshire-Vermont Telephone Associations (joint convention), Poland Spring House, Poland, Maine, June 28, 29 and 30.

Michigan Independent Telephone Association, Pantlind Hotel, Grand Rapids, Sept. 8 and 9.

Rocky Mountain Telephone Association, Hotel Utah, Salt Lake City, Utah, Sept. 15 and 16.

Arkansas Telephone Association, Arlington Hotel, Hot Springs, Sept. 26 and 27.

United States Independent Telephone Association (annual convention), Conrad Hilton Hotel, Chicago, Oct. 10, 11 and 12.

North Carolina Independent Telephone Association, The Carolina Hotel, Pinehurst, Oct. 17 and 18.

Oklahoma Telephone Association, Huckins Hotel, Oklahoma City, Oct. 20 and 21.

Virginia-West Virginia Independent Telephone Associations (joint convention) Hotel Roanoke, Roanoke, Va., Oct. 20 and 21.

Alabama-Mississippi Telephone Association, Thomas Jefferson Hotel, Birmingham, Ala., Nov. 14 and 15.

File Federal Charge Against Texan for Using Slugs

Federal charges of using slugs in pay telephones were filed Apr. 13 against a 74-year-old San Antonio (Tex.), man reputed to have a $77,000 bank account.

The charges of "using metal discs in the place of U. S. coins" were filed against James P. Steen. Secret Service men said he used slugs to make pay telephone calls in his business.

Mr. Steen paid Southwestern Bell Telephone Co. more than $104 in restitution.

V V

Two Ohio Independents Seek Rate Adjustment

Two Independents have filed application with the Ohio Public Utilities Commission for authority to increase rates and charges for service to their subscribers, it was reported on Apr. 25.

The Sycamore Telephone Co. and New Bavaria Farmers Mutual Telephone Co. contend existing rates do not afford them a fair rate of return upon the value of their property.

IN THE NATION'S CAPITAL

Concluded from page 18

made and being made in a period of abnormal expansion and rising costs. Its employment is generally followed by rate regulatory commissions in other states.

"We agree with the commission that an end-of-period rate base is fair and reasonable, especially under the circumstances presented here. Its use tends to offset the lag in the return of earnings during the period between the time the money is invested and the time earnings are received."

One other point covered in the Virginia Electric case which often bobs up in telephone cases has to do with the old argument about the "comparative rate of return." Where a telephone company serves in more than one state, its rate case opposition has been known to attempt to justify a subnormal rate of return by pointing out that the company is not earning any less there than in other states (where it serves) and perhaps is earning even more. Such a justification by way of recrimination (which is logician's lingo for saying that two wrongs make one right) is fallacious. And the Virginia court said so, in disposing of a similar argument made by Arlington County. The court said:

"The county charges that the commission erred in authorizing the company to put into effect rates allowing a higher return in Virginia than it receives in other states in which it operates, and that the authorized rates are higher than those charged by the Potomac Electric Power Co. for electric energy in the same area as that served by the appellee, that is, in the Arlington-Alexandria area.

"We are not here concerned with rates of return allowed in other states. The question here is whether Virginia consumers of electricity are charged a fair rate. No evidence was presented showing the cost conditions under which the Potomac Electric Power Co. operates. Therefore, no proper comparison may here be made with its rates."

Co-op Competition Suit Thrown Out

Another recent electric utility decision of interest to telephone companies comes to us from the U. S. Circuit Court of Appeals for the District of Columbia. This was not a rate case. It was a suit started by eight privately-owned electric companies in Kansas, Missouri, and Arkansas to halt the granting by REA of a loan which would set up a competitive cooperative in the generating and transmission business and allow it to carry out a supply contract with power distributing cooperatives. The suit was started way back in the middle of the Truman administration, in an effort to block an REA loan of 33 million dollars for the establishment of a so-called "super co-op," which would serve other distributing co-ops directly serving farm customers with electric power.

The private utilities complained that Uncle Sam was financing their own business competition with the help of their own taxes, as well as taxes collected from all the rest of the people. The utilities further complained that it was not the intent of Congress, in setting up the REA, to have tax funds used for the purpose of destroying or injuring established private tax-paying business, through the financing of rival facilities. The utility companies contended that they are ready, willing, and able to furnish the distributing co-ops with all the power and transmission service necessary and that the "super co-op's" program was simply a public ownership scheme to put the private companies out of business at the taxpayers expense.

The utilities lost in the U. S. District Court and now they have lost again in the U. S. Circuit Court of Appeals. The higher court held (2 to 1) that the privately-owned electric companies have no standing in order to block the super co-op's program, merely on the grounds that competition might result if it were carried out. Their "sole interest and objective," said the majority decision "is to eliminate the competition which they fear." Judge E. Barrett Prettyman said, in a dissenting opinion, that the electric companies ought to be allowed to bring suit to contest the super co-op's contracts in court. He said that these contracts would take away all of the private companies' rural business and "would be complete destruction . . . not a mere establishment of competition."

Since this litigation was started, the present REA administration has adopted a more restrained policy on granting loans for construction of generating, and transmission facilities, or so-called "super co-op" loans. But the court's opinion indicates that if we ever get a different REA administration in the future, and if it decides to open up once more on financing competitive power plant building by cooperatives, private utility companies will have no right to complain in court —no matter how much their business might be hurt.

Fortunately for the telephone companies the telephone loan section of the REA Act is differently worded from that of the rural electrification section. Telephone loans are supposed to be granted in such a way as to avoid the financing of unnecessary competition between companies or co-ops. But such language is always subject to devious construction and interpretation. The net result of the Arkansas-Missouri "super co-op" decision is not reassuring, from the standpoint of the security of private enterprise in the public utility business.

Wisconsin Companies Complain About State's Microwave System

In Wisconsin, spokesmen for telephone companies complained on Apr. 21 that they had not been consulted before the state began constructing its own microwave communications system, according to local newspapers.

They asked the legislature's joint finance committee for an amendment in a bill to set up a division of general services in the governor's office. The change would permit telephone companies to make service offers on any communications project proposed by the state.

Atty. W. E. McGavick, Milwaukee, representing the Wisconsin Telephone Co., offered the amendment, which would make the state public service commission the judge of whether the state or a private company could best provide message service between state offices and departments.

Atty. Robert Rieser, Madison, representing the Wisconsin State Telephone Association, supported such a change.

The 1953 legislature provided $254,000 for construction of a state microwave system. Such a system carries messages on radio beams between towers several miles apart, rather than over wires.

This will let radio operators in a central office atop the state office building here send out messages over police radio transmitters throughout the state. The system also has been proposed to replace the state telephone lines connecting ranger stations.

The microwave system is about half completed. Links are operating between Madison and Baraboo, between Madison and Delafield, between Baraboo and Chilton, and between Black River Falls and Menomonie.

The microwave system would be part of the proposed new general services division. It would bring together the purchasing bureau, engineering bureau, police radio system and a new bureau of management services. The four bureaus, headed by civil service directors, would be under the director of general services, who would be the governor's financial secretary.

The bill was supported in a message to the committee from Gov. Kohler. He said that it would make the state government more efficient and would result in savings of at least half a million dollars a year.

The bill also was supported by David Carley, Madison, representing the Wisconsin State Chamber of Commerce. He said that officials of private industries had approved it. Kansas and Pennsylvania have set up similar "housekeeping" agencies after studying the Wisconsin proposal, he said.

Kansas Commission Authorizes Two Rate Increases

The Kansas Corporation Commission on Apr. 27 granted rate increases to two companies.

The Barnes Telephone Co., serving 320 customers, was granted an increase of $1,905 annually, and the Vermillion Telephone Exchange, with 184 customers, was granted a yearly hike of $1,062.50.

General of Michigan Sells $6,800,000 of Stocks and Bonds

General Telephone Co. of Michigan, Muskegon, on Apr. 26 sold to a group of underwriters 100,000 shares of its $2.40 cumulative preferred stock, $50 par value, totaling 5 million dollars. L. H. Meyer, president, announced that the underwriting group for this offering was headed by Paine, Webber, Jackson and Curtis, and Stone & Webster Securities Corp.

Mr. Meyer also announced that 1 million dollars principal amount of first mortgage bonds, 3⅜ per cent series due 1985, were sold at par to two institutions, and that 40,000 shares of its $20 par value common stock were sold to General Telephone Corp.

The company president stated that proceeds from these transactions were used to retire 2 million dollars of short-term bank loans, to repay $800,000 of General Telephone Corp. notes, and to redeem all of the company's outstanding $2.70 cumulative preferred stock amounting to $3,882,300, plus redemption premium and accrued dividends.

France, Switzerland Linked

A direct radio-telephone line will open this summer across the Lake of Geneva linking Lausanne, Switzerland, with Evian, France.

Investing—a Simple Matter

It is probably true that a good many people who'd like to invest some of their savings in stocks don't do so for the reason that they aren't sure how to go about it.

Yet, as the *Wall Street Journal* has pointed out, "It's as easy to buy a stock as it is to purchase a television set or a washing machine. The investor merely enters a brokerage office and tells an employe: 'I'd like to place an order.' "

For his service, the broker charges a commission, which is based on the price of the stock and the amount of the transaction. That commission is moderate. For example, if the customer buys 100 shares of a stock selling at $40 a share, a firm which is a member of the New York Stock Exchange will charge $35. If he buys 50 shares (known as an odd-lot) at $30 a share, the commission is $18. These commissions are much less than is generally charged by agents dealing in other kinds of property, such as real estate.

Moreover, nowadays it isn't necessary to pay cash for all the stock you want. A pay-as-you-go purchasing system went into effect some time ago that a great many people have taken advantage of. This is also handled through the brokerage houses, and payments may be as little as $40 a quarter ($160 a year). It's like buying a TV set on time, with one exception — if the purchaser stops making payments he doesn't lose what he's invested. He gets whatever amount of stock he has paid for.

Stock-ownership is for the many, not the few—as the fact that more than a third of all shareowners are in the $2,000-$5,000 income bracket proves. And the mechanics of buying it are geared to meet the needs and desires of the many.—*Industrial News Review.*

Almost a year of work by Nebraska Continental Telephone Co., Columbus, Neb., on the conversion of four exchanges was concluded recently with the successive conversions of Battle Creek, Orleans, Palmer and Beaver City, Neb. Each of these exchanges has been converted from magneto to unattended automatic operation, with step by step equipment manufactured by the Automatic Electric Co., Chicago. LEFT PHOTO: Shown at a dinner celebrating conversion of the Beaver City exchange are (left to right): MAYOR DEWEY HEIDLOFF of Beaver City; COMMISSIONER PAUL E. PETTYGROVE, member, Nebraska Railway Commission, and W. T. AUTRY, vice president and general manager of Nebraska Continental. RIGHT PHOTO: New exchange building at Palmer, housing unattended automatic equipment. Outdoor telephone booth furnishes service.

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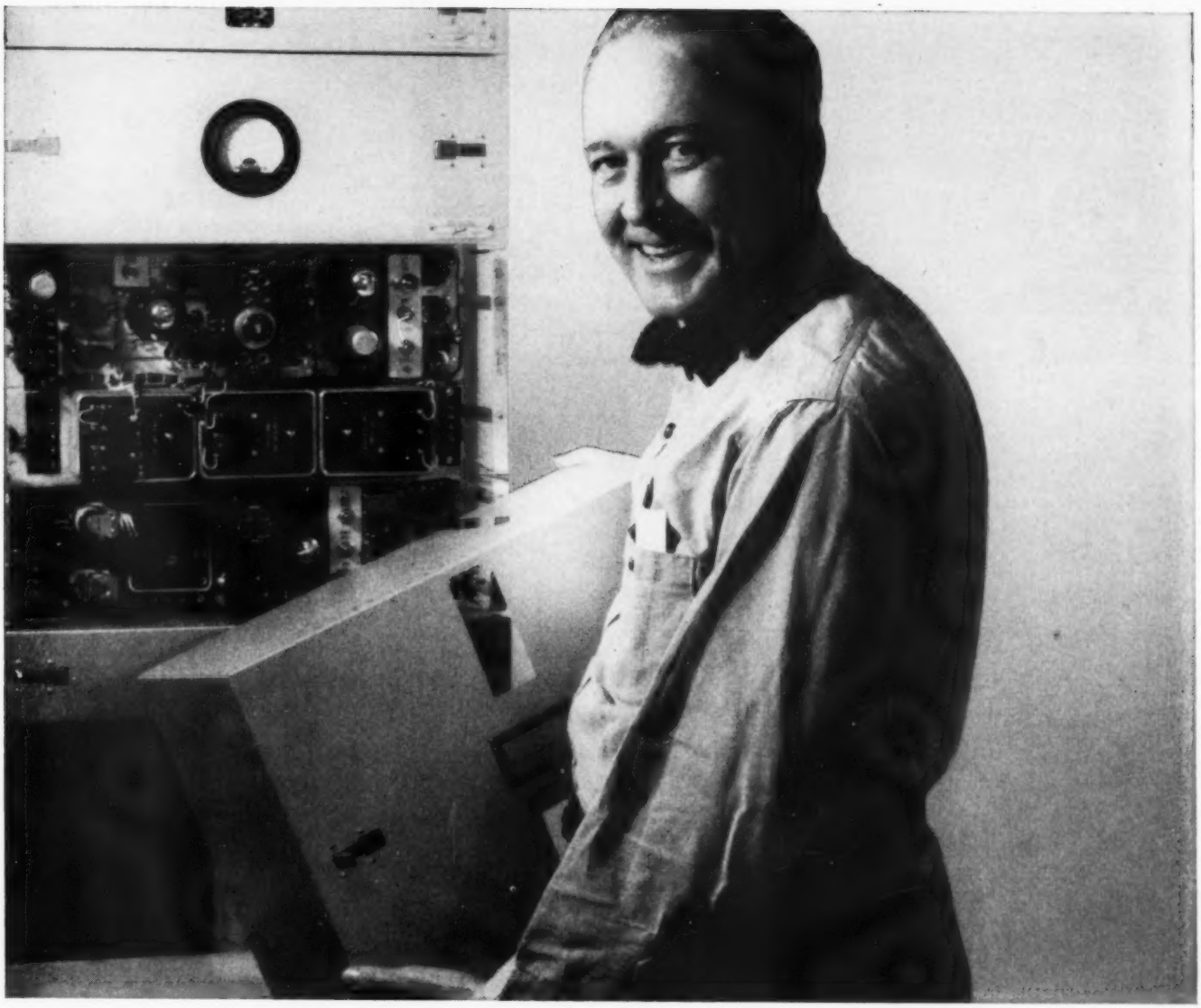

"I'm adding new channels—the easy way"

"We're following the lead of most of America's major telephone companies. We've found that Lenkurt Type 33A Carrier is the least complicated, least expensive, most reliable way to add new channels."

This carrier "proves in" over physical lines—even for distances as short as 10 miles! And with Lenkurt Type 33A *you can start small and expand!* Begin with a single channel, add a second, then a third. Add more Type 33A channels on nearby pairs, and if heavier traffic demands it, add Lenkurt high-frequency systems above these channels, on the same lines.

It's easy to install, too! With Lenkurt Type 33A Carrier, you simply bolt a compact, factory-assembled, factory-tested unit in place; hook up line, power, voice termination, and ground connections—and cut it in! Compare this with stringing new wire—buying the necessary hardware, operating a line crew, rescheduling other line and maintenance work.

It's simple to service and maintain. Standard, low-cost testing equipment and familiar techniques take care of all tests. If you're short of transmission channels—Lenkurt Carrier can provide them with simplicity and ease.

Write for Bulletin T-33A-P20 . . . or consult Automatic Electric carrier engineers for their specific recommendations. Address: *Automatic Electric Sales Corporation, 1033 West Van Buren Street, Chicago 7, Illinois.* OR call HAymarket 1-4300. Offices in principal cities.

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AUTOMATIC ELECTRIC — A GREAT NAME IN COMMUNICATIONS — LENKURT

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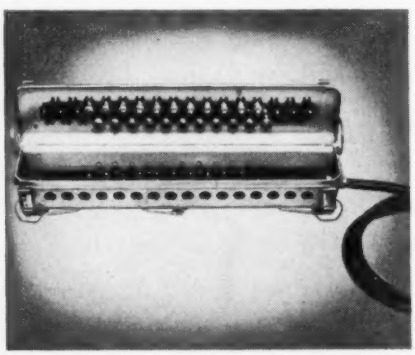
by C. J. Reynolds, Stromberg-Carlson

The few dollars you spend on *reliable* equipment today will be repaid a hundredfold in lower maintenance costs for years to come. Protect your investment with the double guarantee offered by Stromberg-Carlson. First, leading manufacturers build this equipment, and guarantee it. Second, because we recommend and sell this equipment to the telephone industry, we *also* guarantee its performance!

Designed for economy

That's the way to describe the New "Stranterm" cable terminal, the most flexible terminal ever developed. The Stranterm is primarily strand-mounted, but may be pole-mounted. The stub may be taken out of either end of the terminal



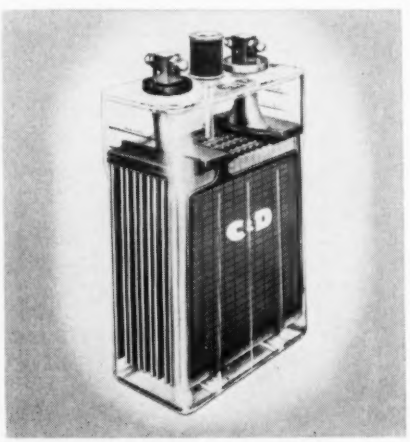
Strand-mounted cable terminal.

and can be either lead or plastic cable. The core section is gas-tight and moistureproof; the terminal may be protected, **even after installation,** either fully or on a pair-by-pair basis by the addition of Cook's "snap-in" Mini-Gap arresters. The 11 and 16 pair core assemblies are interchangeable and replaceable; and drop wire openings are completely sealed by an exclusive grommeting arrangement. Manufactured by Cook Electric Company in 11, 16 and 26 pair sizes, with 3½ foot cable stubs.

Order from your Stromberg-Carlson representative.

These two battery types give you decades of good service

Here's a dependable power supply for you with a life expectancy of **25 years!** It's the C & D Plasti-



This low-cost PlastiCell battery has life expectancy of 14 years. Its PlastiCal counterpart will last you 25 years.

Cal telephone battery, and when we say it will last 25 years, we're thinking about **full float service.**

You get this extra-long life because C & D PlastiCal (lead-calcium grids) batteries have an exclusive suspended and supported plate construction.

If a 14-year life expectancy will fill your needs, C & D has an economical battery for that, too. It's the PlastiCell battery, using high-tensile lead alloy grids.

In the picture, you see one of these PlastiCell batteries. It's the CE-11 and has a 660 A.H. capacity. In PlastiCal, specify PCE-660.

Both PlastiCal and PlastiCell are available in other capacities. You can order them from your Stromberg-Carlson representative.

Guard your stations with these fuseless protectors

Shown here are two models of fuseless station protectors—both designed to guard your stations 24 hours a day, requiring no maintenance or attention at all.

No. 700 protector—for indoor use.
No. 800 protector—has weatherproof housing for outdoor installation.

The No. 700 is built for indoor use. You'll find its workable design combined with small size are just what you need.

No. 800 is weatherproofed for trouble-free outdoor mounting.

Both models are approved and listed by the Underwriters' Laboratories, Inc., for use where installations meet the requirements of the National Electrical Code (see Article 800). Each of them mounts two Reliable No. 504 self-contained,

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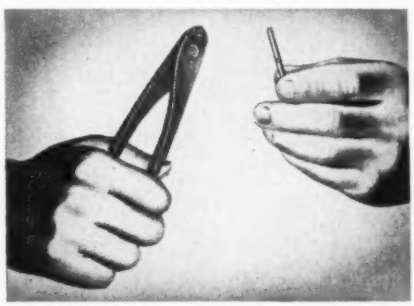
weatherproofed screw-in type protector units, which house carbon electrodes spaced approximately .0035" for air gap.

Manufactured by Reliable Electric Co. Your Stromberg-Carlson representative is ready to supply them to you.

Splice it fast . . .
and it *stays* fast

Here's how to make a quick splice that holds fast, even under the most intense vibration. In fact, your splice will outlast the conductor!

You need two items; a Nicopress sleeve, and the Nicopress tool that is designed especially for use with these sleeves. You simply butt the



This Nicopress 17-2 tool plus this Nicopress sleeve make better pair splices, faster.

bared wire ends together inside the sleeve, and you've got a joint that won't ever pull out! Quick and easy.

The alloy lining inside the sleeve is harder than either the conductor or the sleeve, and forms a joint that is stronger than the rated breaking strength of the wire itself. **And** it has a high, lasting conductivity.

Also—joints made with Nicopress sleeves are small and neat, so they may be applied on inside wires as well as outdoor lines.

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Directors of Ohio Independent Vote to Amend Incorporation

The Wellington (O.) Telephone Co.'s board of directors has taken action to amend the articles of incorporation to provide for the issuance of $200,000 of 5 per cent preferred stock.

This is to provide additional funds for proposed improvements to the telephone system and to retire bank notes for improvements already made.

Under its to-be-amended charter, the board could issue up to $60,000 of 6 per cent preferred stock and up to $100,000 of common stock.

OBITUARIES

FRANK J. REAGAN, 72, a leader in the telephone industry on the Pacific Coast for many years, died on Apr. 24 at his home in Berkeley, following a brief illness.

Mr. Reagan retired as a vice president of the Pacific Telephone & Telegraph Co. in 1948, continuing as a director.

The Reagan career covered a period of pioneering, and the first great surge of growth in the telephone industry. He began as a traffic inspector for the New England Telephone & Telegraph Co. in 1909, and transferred to Pacific Telephone in 1910. In 1922, he became superintendent of traffic in San Francisco with responsibility for a large part of northern California.

In 1925, Mr. Reagan headed traffic work in the northern part of New York State, for the New York Telephone Co., then returned to Pacific in 1926 as general commercial manager in northern California.

He became assistant to the president in 1928, with responsibility for public relations and personnel, and was elected vice president for information and personnel in 1929. In this position he established a nationwide reputation by pioneering many advances in personnel relations, advertising, and public relations, the company reports.

Mr. Reagan was born in Natick, Mass., was educated at Phillips-Andover, and at Dartmouth. He is survived by his widow, Marguerite Shipman Reagan.

* * *

MOISTON P. WHALEY, 74, resident of Albany, Mo., died in his sleep on Apr. 14. He had been suffering with a heart condition for some time, but his death was unexpected.

Mr. Whaley was born in Albany, May 19, 1881.

He entered the telephone business in 1911 as a director of the Albany Telephone Co., serving that company as manager, and at the time of his death, was president. He was a member of Theodore Gary Chapter of the Independent Telephone Pioneer Association.

Mr. Whaley was a former mayor of Albany.

He is survived by a brother, Otis T. Whaley, and a sister, Mrs. Carl Magee.

P. M. Ferguson Jr., General Manager of Mankato Company

P. M. Ferguson Jr., was named general manager of Mankato (Minn.) Citizens Telephone Co. at a recent meeting of the board of directors.

He succeeds his father, P. M. Ferguson Sr., who had been general manager of the firm since 1908. The elder

P. M. FERGUSON JR.

Ferguson will remain president of the company—a post he has held since February, 1954.

The new general manager joined the company on a full-time basis in December, 1945, after he was discharged from service. He was promoted to assistant general manager in March 1947.

Mr. Ferguson is a director of the Minnesota Telephone Association and a member of the Advertising Committee of the United States Independent Telephone Association.

He also has appeared on programs of state association conventions, presenting addresses on various phases of telephone company operations.

"There is nothing new about automation except the word itself. The facts of automation, and the mechanics of it, are older than our own American Republic." — BENJAMIN F. FAIRLESS, *chairman of the board, United States Steel Corp.*

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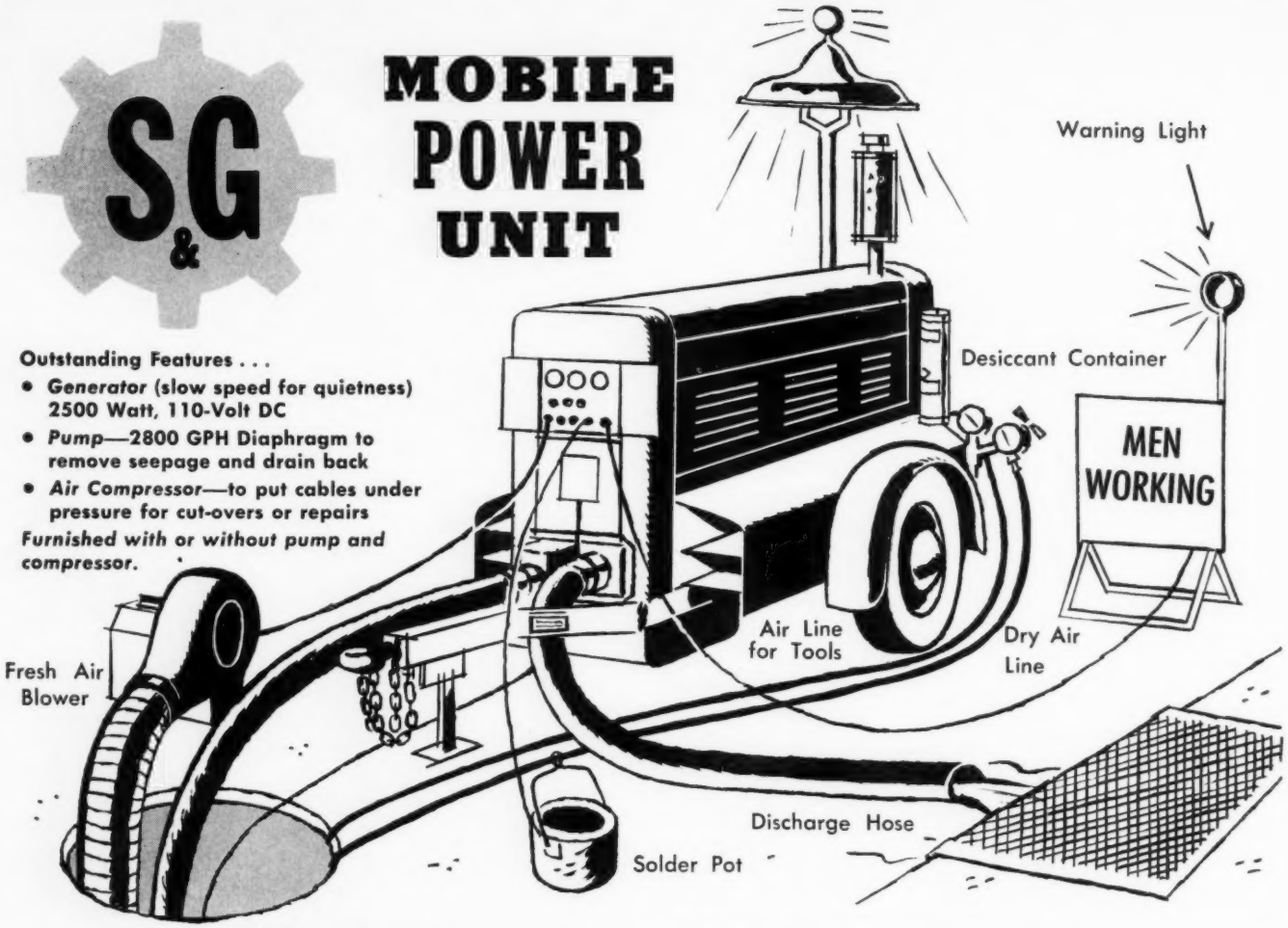
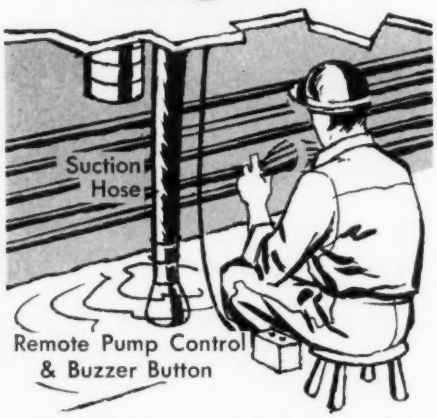
S&G MOBILE POWER UNIT



Outstanding Features . . .

- ***Generator*** **(slow speed for quietness) 2500 Watt, 110-Volt DC**
- ***Pump*****—2800 GPH Diaphragm to remove seepage and drain back**
- ***Air Compressor*****—to put cables under pressure for cut-overs or repairs**

Furnished with or without pump and compressor.



- 300-Watt floodlight illuminates working area
- operates soldering pot and iron, electric and air tools
- electric blower to ventilate manhole
- supplies dry air for cable cut-overs, flash testing, etc.
- diaphragm pump can be operated from manhole by push button control
- buzzer signal for summoning helper
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New York Bell Effects Executive Promotions

The appointment of Williard G. Hampton, vice president (operations) of the New York Telephone Co. to the new post of executive vice president was announced on Apr. 27 by Keith S. McHugh, president, following the April meeting of the company's board of directors.

At the same time Wellington Powell, vice president and general manager of the Manhattan-Bronx-Westchester area, was named vice president (operations). John D. Dodd, vice president (staff), succeeds Mr. Powell and Karl T. Dutschmann, assistant vice president, takes Dodd's post.

The appointments were effective May 1.

Mr. Hampton, who entered the company in 1927 as a student engineer in Albany, rose through various engineering and plant department posts to become vice president and general manager of the company's Long Island area in 1950. He later served as an assistant vice president of the American Telephone & Telegraph Co. before returning in 1952 to the New York Telephone Co. as vice president (operations). He is a director of the company and a member of the executive committee.

Mr. Powell has been in charge of the Manhattan-Bronx-Westchester area since 1950. He had previously been vice president (public relations) and earlier was vice president and general manager of the upstate area. He began his career in 1921 as a representative in the company's commercial department in Manhattan.

Prior to joining the company in 1924, Mr. Dodd was a traffic student for two years in the Bell Telephone Co. of Pennsylvania. In recent years he was assistant vice president of the personnel department and later general commercial manager of the Manhattan-Bronx-Westchester area.

Mr. Dutschmann entered the company in 1921 as a student engineer in New York City. He was for six years chief engineer of the Long Island area before becoming an assistant vice president late last year.

"Automation will not eliminate jobs. It will supplant heavy, dangerous, and unpleasant jobs with easier, more skilled, more pleasant, and interesting jobs."—R. H. SULLIVAN, *vice president, Ford Motor Co.*

REA APPROVES LOANS

Concluded from page 19

The borrower plans to use these loan funds to convert the existing system, serving 657 subscribers, to dial operation, and add other facilities to serve 139 rural families in the community now without telephones. About 164 miles of the existing line will be rebuilt and 30 miles of new line added.

New automatic central offices for the system will be constructed at Chaseburg, Coon Valley and Stoddard. When completed, the Coon Valley company will operate 222 miles of line.

Joseph Linrud is president and O. S. Moilien is manager of the Coon Valley company.

* * *

Mid-Rivers Telephone Cooperative, Circle, Mont., on Apr. 21 was allocated a loan of $81,000, second loan to this borrower.

This loan, together with the first loan of $1,482,000, will be used by the Mid-Rivers cooperative to construct a modern telephone system to serve 1,996 subscribers in east central Montana.

Automatic central offices for the new system will be located at: Bloomfield, Brockway, Brusett, Circle, Crane, Fallon, Green, Jordon, Lambert, Lindsay, N. McCone, and Richey. There will be service without toll charge between some of the borrower's exchange areas. The system, when completed, will consist of 1,960 miles of line in Dawson, Garfield, McCone, Prairie and Richland counties.

C. R. Thiessen is president and Ellis Jones is manager of the Mid-Rivers cooperative.

V V

Announce Speaker for Annual Gary Pioneer Luncheon

The annual luncheon and business meeting of the Theodore Gary Chapter of the Independent Telephone Pioneer Association will be held on May 23 at the Town House, Kansas City, Kan. This will be in conjunction with the joint convention of the Missouri-Kansas Telephone Associations which meet May 23 and 24.

Dr. Kenneth McFarland of Topeka, Kan., educational consultant to General Motors, will be guest speaker, and his subject will be "Lamp Lighter."

V V

>> It has been said that it is every American's duty to support his government, but not necessarily in the style to which it has become accustomed.

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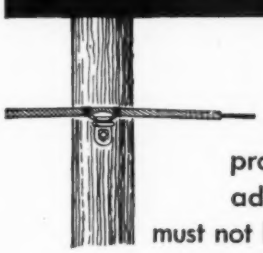

PLASTIC insulated wires within a jacket are proving to have definite electrical and economical advantages. However, this thermoplastic insulation must not be subjected to concentrated stresses. Ordinary support fittings are not suitable for this type of cable. THE ANSWER: PLP Dead-Ends and Tangent Support Line Guards used as shown above protect while firmly holding cable in an elongated grip, in which the unit pressure is small because of the large area of the gripping surface. For details of their exclusive advantages, ask your Telephone Supplier or write us for Descriptive and Technical Data.

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for both regular and heavy-duty cutting

It was Klein that produced the first and still the finest regular side-cutting plier. Klein also gave the industry the modern, streamlined version so much in demand.

And it's Klein again with a new, high leverage cutting plier for light- or heavy-gauge wire, including No. 2 weatherproof hard drawn solid copper wire, and A.C.S.R.

There's no extra hinging of any kind—no uncomfortable wide-spread handles—with this new Klein-Kut Plier. The offset hinge permits the extra-high leverage and operation is as smooth and easy as with any other Klein Plier. Forged from high-grade tool steel, individually fitted, tempered, adjusted and tested. Ask for No. 213-9 N.E. for streamlined pattern.

Regular pattern available

Same high-leverage design, but in the original Klein side-cutting pattern. Ask for No. 213-9.

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CORROSION OF UNDERGROUND CABLES

Continued from page 22

positive and the zinc the negative pole, and the reasons for this were shown as far as the chemistry was concerned. The reason the polarity turns out this way is the electromotive force table *(Chart I)*, which is printed elsewhere with this article. This table is the electrical relation between some common materials. It is based upon lead as a reference point. What it means is that if an attempt were made to build a battery by placing a piece of lead and any other of these metals in an electrolyte, a voltage would be developed, the value of which would be the number given. The polarity, *compared to lead*, would be in the direction indicated. That is, if the other metal is above lead on the table it is positive, if it is below, it is negative.

Electromotive Series of some Common Metals (Compared to Lead)

Gold	1.48	volts	positive
Platinum	.98	"	"
Silver	.81	"	"
Copper	.356	"	"
Hydrogen	.12	"	"
Lead	.0	"	"
Tin	.02	"	negative
Nickel	.11	"	"
Cadmium	.28	"	"
Iron	.32	"	"
Zinc	.75	"	"
Aluminum	1.21	"	"
Magnesium	1.43	"	"

Chart I

While the table was written for lead, it is valid for indicating relative polarity for any two metals. For our simple battery, note that copper is higher up the table than zinc, thus is always positive in a copper-zinc combination. If the zinc, on the other hand had been matched up with a magnesium strip instead of copper, the zinc would have been positive instead of negative, and the magnesium instead of the zinc would have corroded, because magnesium is more negative than zinc. This extreme negative polarity is used in a method for preventing cable corrosion, as will be shown in a later chapter in this series.

Before leaving our simple battery, there is one more lesson to be learned. We know that if a single piece of metal, such as the zinc in the above battery, is put into acid, it will corrode without the assistance of a copper plate. Actually, it would corrode away a lot faster if a copper plate were placed in the acid, and the two metals short circuited together.

Local Action

However, when the single plate corrodes it is called *local action.* Even though no positive plate is actually placed in the acid, it is there just the same, in the form of impurities in the zinc. If the zinc was chemically pure it would not corrode in the acid, but tiny particles of impurities such as carbon, iron or what-not in the zinc supply the positive terminal necessary for corrosion.

This local action is very much present in corrosion of underground cables, and is a factor of major importance. The cases shown in *Fig. 1.2* and *1.3* are classed as local action.

It should be noted in all of this that it is direct current only with which we are concerned. Alternating current does not result in corrosion, unless somehow it becomes rectified into dc. The reason why ac is not corrosive is that while a positive pole takes metal into a fluid, a negative pole, as in the case of electroplating will take a metal out of a fluid and build it up on a terminal. Thus, with ac, that metal which might be lost on the positive half-cycle, will theoretically be returned on the negative half-cycle.

This actually happens in a storage battery. During discharging, lead combines with acid to make lead sulfate. During charging, the current is forced through the battery in the opposite direction because of the higher outside charging voltage. What was the positive terminal (inside the battery) becomes the negative with *respect to the fluid*, and the metal is returned from the acid to the plate. It is returned as a fine powder which is why the plate

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has tiny grids on it to receive this powder. Actually some of the powder fails to get in these grids and falls to the bottom of the cell. This is what causes a battery to ultimately wear out.

In passing, it should be noted that in charging a battery, the actual polarity, positive and negative of the charger is not reversed, but is the same as the battery, but of higher voltage. It is because of this higher voltage that the current flows back into the battery instead of out of it. These principles are used in the correction of corrosion of cables by what is called "forced drainage" of which more later.

The foregoing material outlined the basic chemical and electrical principles involved in corrosion. In summary, it might be said that the requirements for corrosion are the same as for building a battery: There must be two conductors in a moist environment, and a path for current to flow. Where the current flows from a positive conductor into a fluid, corrosion will occur.

The next chapter will show the application of these principles and also explain corrosive currents from outside dc sources.

» Thirty-nine per cent of the deaths and 35 per cent of the injuries due to motor vehicle accidents last year occurred on Saturdays and Sundays.

IOWA INDEPENDENTS

Concluded from page 26

one that is two or three months in arears.

"By keeping all bills on a current month basis, you are doing your subscribers a favor and you are keeping your finances in better condition so that you can pay your bills, and when it becomes necessary for you to borrow money, your credit rating will be good. Your subscribers look upon you as you look upon other businesses. You do not want to do business with a firm that is on the rocks or always on the verge of failure. Keep your collections good."

Mr. Carlson traced the improvement in service made by Iowa Independent companies, through the assistance of the association's Small Company Committees. He reported:

"At the close of World War II there were only eight Independent dial exchanges in the state of Iowa. There are now 150 Independent dial exchanges. Most of these have been converted to dial since 1950. In 1954, an average of one exchange every 10 days was being converted to automatic in Iowa and in 1956 there will be one exchange every six days converted to automatic operation.

"Today, good telephone operating people are taking that forward look and are making plans to convert their exchanges. Those of us who have exchanges under 750 stations enjoy an exemption from the wage-hour law. If this exemption were suddenly removed, there would be very few companies who would be financially able to pay the rates set up under the wage-hour law. For this reason alone, it is necessary to convert our exchanges to automatic at the earliest possible time."

The convention re-elected the following directors: V. B. Clark of Fort Dodge; W. H. Fowler of Pella; J. J. McIntosh of Cedar Rapids; L. E. Travis of Newton; J. L. Trevillion of Chariton, and E. B. Zerwas of Manning. A. E. Long of Sloan was elected a director to succeed Frank Gordon of Fort Dodge, resigned.

Other directors are: H. C. Amick of Des Moines; E. G. Bellamy of Knoxville; R. E. Brandel of Mt. Pleasant; E. G. Carlson of Creston; A. L. Kelley of Clarinda; Clyde McFarlin of Montezuma; H. F. Melick of West Liberty; L. F. Morrison of Grinnell; C. C. Pearce, Riceville; V. D. Peck of Primghar; A. W. Sanders of New London; J. A. Schuttloffel of Walnut; Harold Thompson of Clear Lake; Ross Vernon of Sioux Center, and H. B. Melick of West Liberty (honorary director).

The directors re-elected the following officers: President, Mr. Carlson; first vice president, Mr. Vernon; second vice president, Mr. McIntosh; counsel, Mr. McFarlin, and secretary-treasurer, W. F. Miller.

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N. C. Hasbrook Named Secretary Of California Association

Born in Columbus, O., on Sep. 13, 1911, Neal C. Hasbrook received his basic education in Columbus and attended Ohio State University from October, 1929, until March, 1932. He was registered in the College of Engineering and specialized in the electrical branch.

Mr. Hasbrook began his telephone career with the Ohio Bell Telephone Co.

N. C. HASBROOK

in Columbus in March, 1937. Starting as a central office repairman, he became in June of that year an assistant engineer in the transmission and protection section of the company's general engineering department. In July, 1944, he left Ohio Bell to become chief engineer of Columbus Metal Products, Inc., in Columbus. In January, 1946, he joined the engineering staff of the Curtiss-Wright Corp., where he was employed as a design engineer until February, 1948.

In February, 1948, Mr. Hasbrook moved to San Francisco and joined the staff of the California Public Utilities Commission as a utilities engineer in its telephone and telegraph section. He remained with the commission in that capacity until Apr. 1, 1955, at which time he accepted the secretaryship of the California Independent Telephone Association.

He now lives in Palo Alto. His residence will continue in that location, as the office of the association is being moved to San Francisco on July 1, 1955.

Farmers Lend a Hand Converting Service Station Lines to Dial

Six service station lines, operating from the Dannebrog, Neb., switchboard, will be converted to dial operation this

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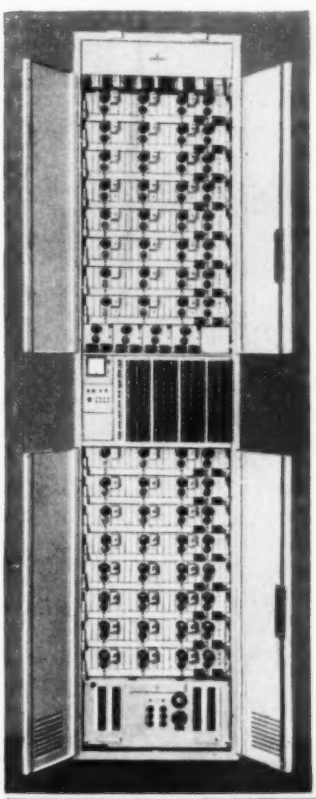

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spring. Most of the work of rebuilding the lines is being done by farmers who work on lines when the weather keeps them out of the fields.

Members of the Dry Creek Telephone Co. are presently clearing timber near Dannebrog so that a new telephone line may be strung. Within the next 30 days they hope to install dial service over a 12-mile line. It is estimated that the change to new service will cost each member about $100.

North Dakota Association of Rural Co-ops Elects Officers

George Jackson, Dawson, N.D., was re-elected president of the board of directors of the North Dakota Association of Rural Telephone Cooperatives.

The election took place at a training meeting of the managers and directors of the 11 cooperatives in the state.

Others elected were Oliver Sund of Cleveland, first vice president; Oliver Dahl of Watauga, S. D., second vice president; Arthur Johnson, Ray, secretary, and G. B. Coleman, Oakes, treasurer.

Bell Adds Texas TV Station Making 363 Total in U. S.

Station KFDM-TV, Beaumont, Tex., was interconnected with the Bell Telephone System's nationwide network of television facilities on Apr. 25.

The Long Lines Department of American Telephone & Telegraph Co. said a new 80-mile microwave route beams network programs from Houston, Tex., to the telephone building in Beaumont. From there, a local channel provided by the Southwestern Bell Telephone Co. carries the programs to the station's studios.

With the addition of KFDM-TV, network television service is now provided to 363 stations in 236 cities in United States.

PUBLIC RELATIONS

"It is a well-known saying that 'public relations begins at home'; public relations consists quite as much in *doing* the right things as in *saying* the right things. No public relations program can take the place of sound policies."— HAROLD BRAYMAN, *director, public relations department, E. I. du Pont de Nemours & Co., Inc.*

"Common stocks are now a necessary part of our conservative investment fabric." — BENJAMIN STRONG, *president, United States Trust Co. of New York City.*

W. V. Kahler Elected Trustee of University of Chicago

William V. Kahler, president of the Illinois Bell Telephone Co., has been elected to the University of Chicago board of trustees, Edward L. Ryerson, board chairman announced on Apr. 14.

Mr. Kahler was graduated from the University of Missouri in 1922 after serving in the Army in World War I, and began his association with the Bell System in 1922 when he joined the engineering staff of Western Electric Co. in New York. He was elected president and board member of Illinois Bell in 1950. During World War II he served as director of construction for the War Production Board.

Mr. Kahler is a trustee of the Illinois Institute of Technology and a director of the Harris Trust & Savings Bank, Marshall Field & Co., the John Crerar library, and the Community Fund of Chicago. He is a fellow of the American Institute of Electrical Engineers and a member of the Western Society of Engineers, of which he is a former president.

Loss from Fire in March Totals $88,197,000 in United States

Estimated fire losses in the United States during March amounted to $88,197,000, the National Board of Fire Underwriters has reported.

According to Lewis A. Vincent, the board's general manager, this $88,197,000 loss represents an increase of 4 per cent from losses of $84,821,000 reported for March, 1954, and an increase of 3.7 per cent from losses of $85,046,000 for February, 1955.

Losses for the first quarter of 1955 now total $248,508,000, a decrease of .07 per cent over the first three months of 1954, when they amounted to $250,242,000.

These estimated insured losses include an allowance for uninsured and unreported losses.

Wisconsin Operator Given Vail Award for Action in Fire

Mrs. Veronica Moore, chief telephone operator for the Wisconsin Telephone Co. at Menomonie, has been awarded a Theodore N. Vail memorial citation for her part in averting more serious fire damage to a home there last November. She was cited for her "intelligent action and effective use of telephone facilities which resulted in diminishing the loss of private property by fire."

Presentation of the Vail citation to Mrs. Moore was made on Apr. 19 at Menomonie by Millard B. Smith, of

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Milwaukee, the company's general traffic manager.

The citation was awarded through the auspices of the Vail Memorial Fund, created in 1920 to perpetuate the ideals of public service held by Theodore N. Vail, president of the AT&T company in its early years. The awards are made to telephone employes throughout the country for noteworthy acts which point up these ideals.

The act which earned Mrs. Moore the citation took place in the early morning of Nov. 11. A subscriber signal flashed on the telephone switchboard shortly before 5 a.m. Mrs. Moore, on duty at the time, plugged in the call but received no answer. Sensing a possible personal emergency, she checked the origin of the unanswered signal and discovered it came from a two-party line. She called police, giving them the addresses of both homes on the line.

Upon investigation, police noted smoke pouring from one house, and radioed the fire department. The family within fled to safety just as the police arrived.

Firemen put out the blaze after confining it to the kitchen. It was found that the fire had burned through the telephone cord causing the signal to flash on the switchboard at the telephone central office.

Mrs. Moore has served Menomonie telephone subscribers for 33 years as an employe of the Wisconsin Telephone Co. She has been chief operator since 1937.

BOOK REVIEW

"STORAGE BATTERIES," by George Wood Vinal, 446 pages, illustrated. Fourth edition. Price $10.00.

The new edition of "Storage Batteries" has been largely rewritten to bring the reader up to date in this rapidly developing industry, and reflects the many technological advances in battery design and construction that have taken place during the past 14 years.

The book emphasizes the scientific principles without becoming too highly technical. Nearly half of the illustrations are new. Physical and chemical properties of materials are discussed, and the reader is given a general description of manufacturing processes.

The clear, practical presentation of the principles of operating storage batteries covers charging and discharging, and all their variations: constant current charge, modified constant potential charge, boosting, equalizing and trickle charge, floating, and system-

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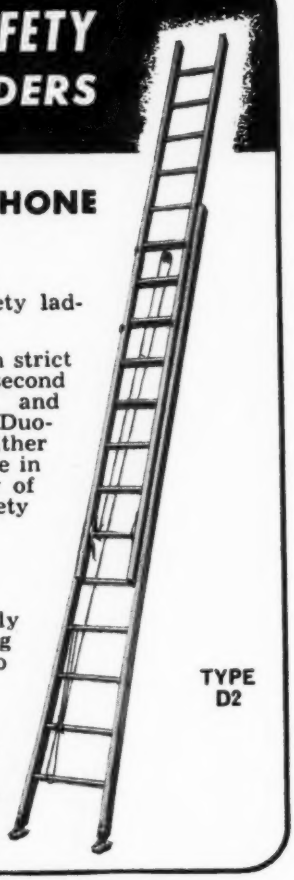

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The author has selected for reference the most valuable papers from the widely scattered literature in this country and abroad. Mr. Vinal has also enlisted the active cooperation of leading experts throughout the industry.

Examples of new information included in this edition which is not in the old ones include practical discussions on:

Improved lead alloys to withstand corrosion.

Increased use of lead calcium alloys.

Increased use of uncalcined high-metallic oxides.

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Many new types of separators.

Increased use of plastic containers.

Production of nickel-cadmium batteries in the United States.

New types of silver oxide cells.

Application of batteries to radio-relay stations for long distance telephony.

Mr. Vinal, at the time of his retirement in 1950, had been chief of the section of electrochemistry of the National Bureau of Standards for 32 years. He is a recipient of the Gaston Planté Gold Medal of the Société Francaise des Electriciens. Among other awards for his outstanding scientific accomplishments are the Acheson Gold Medal and Prize of the Electrochemical Society (1950) and the Department of Commerce's Medal for Meritorious Service (1949). In addition to being the author of many technical papers, he is the author of "Primary Batteries."

This book may be purchased through TELEPHONY.

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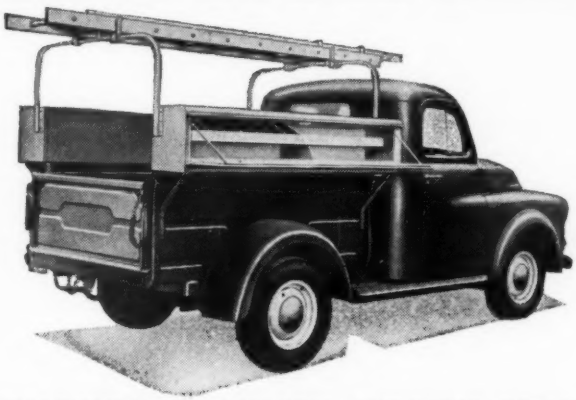

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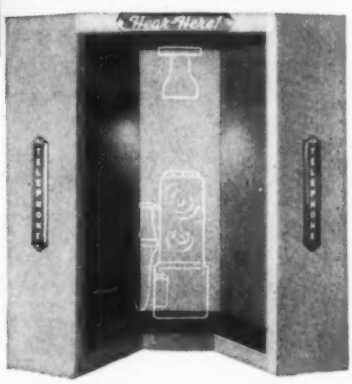

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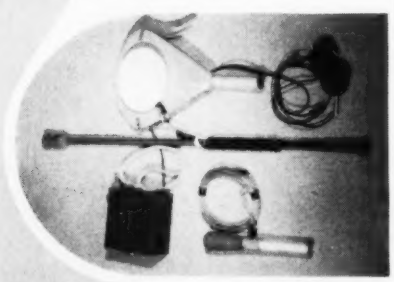

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Stromberg—General Dynamics Merger Plan Announced

The merger into General Dynamics Corp. of Stromberg-Carlson Co., subject to the approval of the share owners of both corporations, was voted Apr. 25 at meetings of the directors of both concerns.

John Jay Hopkins, chairman of the board and president of Dynamics, said that the holders of record of stock of both corporations on May 31 would vote on the merger on June 28. Hopkins, who will continue as chairman of the board and president of Dynamics, reported that holders of the common stock of Stromberg-Carlson would receive one share of General Dynamics stock for each share of Stromberg-Carlson.

The preferred stock of Stromberg-Carlson will be called for redemption prior to the merger. Shares of preferred stock are convertible into 1.4 shares of common stock of Stromberg-Carlson and common stock received on conversion would receive shares of common stock of Dynamics share for share.

As of Mar. 31, the stock capitalization of Dynamics was 4,377,991 shares of common stock (there are no preferred shares of General Dynamics stock). As of the same date, Stromberg-Carlson had outstanding 530,892 shares of common stock and 58,457 shares of preferred stock. Dynamics has recently sold to the public an issue of 40 million dollars 3½ per cent convertible debentures due in 1975.

Following the meetings, Mr. Hopkins termed the merger as an outstanding step in "Dynamics for Defense" in adding to the Dynamics group an outstanding communications and electronics company of world-wide reputation for high quality products.

He stated that this acquisition by Dynamics was a major move in the direction of broadening its base of operations in the electronics field and that in the opinion of the boards of directors of both companies the merger of the two concerns was a logical union.

In addition, Hopkins pointed out, Stromberg-Carlson's civilian commercial business, particularly its telephone, radio-television and sound equipment production, would constitute a sound source of diversification for Dynamics.

Hopkins said that anticipated earnings of Stromberg-Carlson for the year 1955 should contribute substantially to the projected earnings base of Dynamics for this year. The current annual dividend rate of Dynamics of $2.20 per share compares with dividends paid last year to holders of Stromberg-Carlson common stock of $1.525 per share.

Hopkins indicated that no changes in the management of either corporation are contemplated. Stromberg-Carlson will retain its name, individual identification and organizational structure except that it will operate within General Dynamics as the Stromberg-Carlson Division. Robert C. Tait, now president of Stromberg-Carlson, will continue as president of the division and will also become a senior vice president of Dynamics. Mr. Tait, Wesley M. Angle, chairman of Stromberg-Carlson's board, and Bernard E. Finucane, President of Security Trust Co. of Rochester, N. Y., and also a member of Stromberg-Carlson's board, will become members of General Dynamics' board. Mr. Tait will also serve on the management committee of the board of directors and Mr. Angle and Mr. Finucane on the advisory committee thereof.

So far as Stromberg-Carlson is concerned, Mr. Tait said that its board of directors had wholeheartedly approved the merger as being in the best interests of stockholders and its employes. Joining the Dynamics team, he said, will add strength and diversification to Stromberg-Carlson and will bring to share owners a new and stable base of operations and furnish the

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Mr. Tait emphasized the fact that it is the intention of all concerned not only to retain the Stromberg-Carlson operations in its plants in Rochester but to expand them substantially. The good progress made by the company in recent years can now be accelerated in the fields of telephony, radio-television, and sound equipment. In addition, new electronic and communications products for civilian and government use will be developed and manufactured in the company's Rochester plants, he said.

General Dynamics, with three divisions and a Canadian subsidiary, employs approximately 55,000.

Its Convair Division, with plants at San Diego and Pomona, Cal., and Fort Worth and Daingerfield, Tex., is said to produce the most diversified line of aircraft of any firm in the United States.

The division's guided missile operation is extensive and it is now producing for the Navy the Terrier, an electronically guided supersonic surface-to-air missile. Of even greater significance is the division's current development work leading to the ultimate construction of an atomic-powered plane.

In Groton, Conn., the Electric Boat Division launched the world's first atomic-powered means of transport, the submarine USS Nautilus, in 1954. In addition, Electric Boat is building a second atomic submarine, the Sea Wolf, as well as a conventional attack-type at this time.

Canadair Limited, Montreal, is a General Dynamics subsidiary and the largest aircraft manufacturer in Canada. It is also now doing research and development work on the Canadian government's guided missile program.

In Bayonne, N. J., is General Dynamics' third division, Electro Dynamic, producer of high-quality electric motors for specialized commercial and industrial uses.

Stromberg-Carlson has manufactured communications and electronics equipment for more than 60 years. Today, in addition to its line of XY telephone switchboard equipment, instruments and industrial products, it produces television and radio receivers, high-fidelity phonographs; sound equipment, intercom and custom 400 high-fidelity systems, electronic carillons; and electronic and communications products for the armed forces. In addition, Stromberg-Carlson owns and operates three high-power broadcasting stations in Rochester, namely, WHAM, WHFM, and WHAM-TV. The transfer of li-

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SA-53	16-pair	17
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censes of these stations is of course subject to the approval of the Federal Communications Commission.

More than 5,200 are employed by Stromberg-Carlson in its three Rochester manufacturing plants.

Gould-National Batteries Names Atlantic Regional Manager

The appointment of George P. Millington as Atlantic regional manager of the industrial division has just been announced by Gould-National Batteries, Inc. Mr. Millington will continue

G. P. MILLINGTON

the regional headquarters office at 1026 Beury Building, 3701 N. Broad St., Philadelphia. The Atlantic region includes eastern Pennsylvania, southern New Jersey, Delaware, Maryland, Virginia and Washington, D. C.

An Air Force veteran, Mr. Millington joined the Gould organization in 1946 and served as district manager of Gould's Philadelphia office prior to his appointment as Atlantic regional manager.

Automatic Electric Salesman To Head North Texas AFCEA

Howard L. Housley, Automatic Electric Sales Corp. representative in east Texas and Oklahoma, has been elected president of the North Texas chapter of the Armed Forces Communications & Electronics Association.

Other officers chosen were Lt. Col. R. H. Vinding and H. J. Wissemann, vice presidents, and J. A. Gustavus, secretary-treasurer.

Mr. Housley served as president of the Texas chapter of the Independent Telephone Pioneer Association in 1948 and 1950, and is a member of the Telephone Pioneers of America, the American Institute of Electrical Engineers, and the Dallas Electric Club. He has

H. L. HOUSLEY

been associated with Automatic Electric since 1934.

The North Texas chapter of the AFCEA was organized in 1954 to promote in the Fort Worth-Dallas area a closer relationship between military and private industry personnel interested in communications and electronics.

Long-Bell to Treat Lumber with Penta at Louisiana Plant

Another major wood preserving company, Long-Bell Lumber Co., has announced that it has expanded its facilities to include pressure treatment with pentachlorophenol.

The cylinder for penta which is 108 feet long with an 8-foot diameter, is located at the company's DeRidder, La., plant.

Long-Bell will treat fence posts, barn poles and lumber to be distributed to retail dealers throughout the Middle West and South as well as furnishing clean penta-treated poles to telephone companies and other utilities.

The Long-Bell Lumber Co. operates two treating plants in the South, at Joplin, Mo., and DeRidder, and two in the West at Longview, Wash., and Weed, Cal. At the Longview plant, Long-Bell treats with creosote oil and 50/50 petroleum mixture, and at the Weed plant with creosote oil and Wolman Salts. The two southern plants treat with straight creosote oil and the Joplin plant will continue with this treatment.

"If a man is free only to do what his neighbor wishes, he is not truly free. American patriotism requires political allegiance but not uniformity in faith, in culture, or in sentiment. Unity does not involve uniformity."—EARL WARREN, *Chief Justice, United States Supreme Court.*

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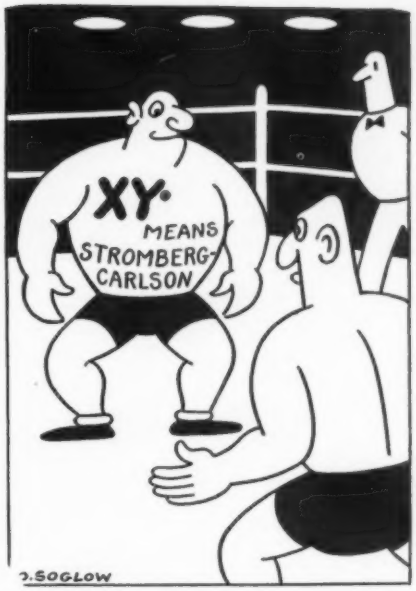

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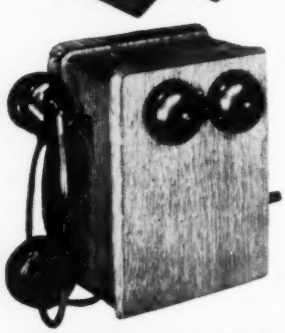

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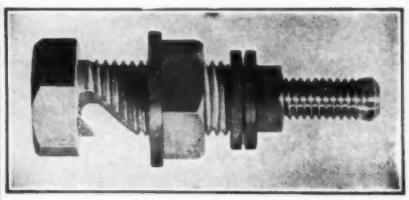

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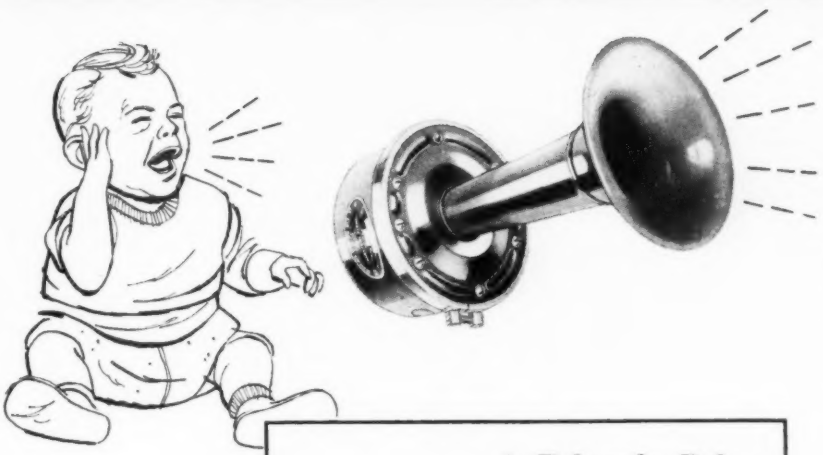
Automatic's pointers for plantmen and managers



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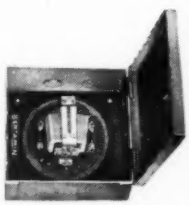
A Benjamin industrial howler, like a baby, can never be ignored. Its insistent, urgent tones cut through the din of the noisiest production shop. The phone is answered quickly, messages come through, instructions are carried out. This makes your industrial subscribers happier because they get more value from their telephones. And it means an extra bit of revenue for you.

Benjamin howlers are furnished weatherproof or non-weatherproof, for outside or inside installations. They operate on 110 volts, 60 cycles AC. Order from the nearest Automatic Electric warehouse today.

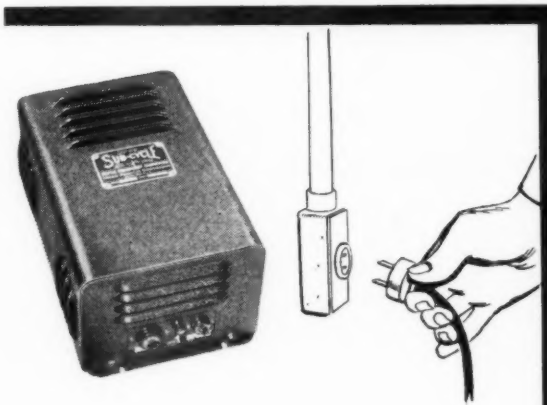
Cat. No.	Type	Each
S-4874	Weatherproof	$14.25
S-4876	Non-weatherproof	11.83

A Telecode Relay



is what makes the Howler sound off. Standard coil windings are 1000 ohms. Furnished with condenser (A), or without condenser (B).

Cat. No.	Type	Each
S-6061	A	$15.18
S-6077	B	11.33



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